E. C. No. 926

ESTIMATES COMMITTEE

(1978-79)

(SIXTH LOK SABHA)

THIRTY-EIGHTH REPORT

MINISTRY OF ENERGY

(DEPARTMENT OF POWER)

Action taken by Government on the recommendations contained in the Sixteenth Report of the estimates Committee (Sixth Lok Sabha) on the Ministry of Energy (Department of power)--Power.

Presented in Lok Sabha on 27th April, 1979

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38th Report of Estimates Committee on Action taken by Government on the recommendations contained in the 16th Report of Estimates Committee (6th Lok Sabha) on the Ministry of Engery (Department of Power) - POWER.

Page	Para	Line	For	Read
3	1.9	3	After the word 'five' add the word 'year'	
4	1.15	-	Recommendation (Sl. No.44, Para Nos. 3.46 to 3.61)	Recommendation (Sl. No.44, Para Nos. 3.56 to 3.61)
4	1.16	2	increased	increases
6	1.22	4	th	the
7	1.24	2	despatched	despatch

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(1978-79)

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STUDY GROUP 'J'

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(1978-79)

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11. Shri K. P. Unnikrishnan.

INTRODUCTION

I, the Chairman of the Estimates Committee, having been authorised by the Committee to submit the Report on their behalf, present this Thirty-eighth Report on action taken by Government on the recommendations contained in the Sixteenth Report of the Estimates Committee (Sixth Lok Sabha) on the Ministry of Energy (Department of Power)—Power.

2. The Sixteenth Report was presented to Lok Sabha on 19 April, 1978. Government furnished their replies indicating action taken on the recommendations contained in that Report on 18 November, 1978. The replies were examined by the Study Group 'J' of Estimates Committee (1978-79) at their sitting held on 23 April, 1979. The draft Report was adopted by the Estimates Committee (1978-79) on 25 April, 1979.

3. The Report has been divided into the following Chapters:—

I. Report.

II. Recommendations|Observations that have been accepted by Government.

III. Recommendations|Observations which the Committee do not desire to pursue in view of Government's replies.

IV. Recommendations|Observations in respect of which Government's replies have not been accepted by the Committee.

V. Recommendations|Observations in respect of which final replies of Government are still awaited.

4. An analysis of action taken by Government on the recommendations contained in the 16th Report of the Estimates Committee is given in Appendix IV. It would be observed therefrom that out of 99 recommendations made in the report, 82 recommendations *ie.* 82.8 per cent have been accepted by Government and the Committee do not desire to pursue 12 recommendations *i.e.* 12.2 per cent in view

of Government's replies. Replies of Government have not been accepted by the Committee in respect of 4 recommendations *i.e.* 4 per cent. Final reply of Government in respect of 1 recommendation *i.e.* 1 per cent is still awaited.

NEW DELHI;
April 26, 1979.
Vaisakha 6, 1901 (*Saka*).

SATYENDRA NARAYAN SINHA,
Chairman,

CHAPTER I

REPORT

1.1. This Report of the Estimates Committee deals with the action taken by Government on the recommendations contained in their Sixteenth Report (Sixth Lok Sabha) on the Ministry of Energy (Deptt. of Power)—Power.

1.2. Action taken notes have been received from Government in respect of all the 99 recommendations contained in the Report.

1.3. The action taken notes on the recommendations of the Committee have been categorised as follows:—

(i) Recommendations|Observations that have been accepted by Government:

S. Nos. 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 18, 19, 20, 22, 23, 24, 27, 28, 30, 31, 32, 33, 34, 36, 38, 39, 40, 41, 42, 43 45, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 57, 59, 60, 61, 62, 63, 64, 65, 66, 69, 70, 71, 72, 74, 75, 77, 78, 79, 80, 81, 83, 84, 85 86, 87, 88, 89, 90, 92, 93, 95, 96, 97, 98, and 99.

(Total82-Chaptr II)

(ii) Recommendations|Observations which the Committee do not desire to pursue in view of Government's replies.

Sl. Nos. 6, 17, 21, 26, 29, 35, 50, 67, 73, 76, 82, and 91

(Total 12—Chapter III)

(iii) Recommendations|Observations in respect of which Government's replies have not been accepted by the Committee:

Sl. Nos. 37, 44, 68 and 94.

(Total 4—Chapter IV)

(iv) Recommendations|Observations in respect of which final replies of Government are still awaited:

Sl. No. 58 (Total 1—Chapter V)

1.4. The Committee will now deal with the action taken by Government on some of their recommendations.

National Power Policy

Recommendation Sl. No. 37, (Para Nos. 2.284 to 2.286)

1.5. The Committee had pointed out that there was a clear statement made by the then Minister of Energy in the Lok Sabha on 4 November, 1976 that the Government were interested in 'evolving a National Power Policy'. It appeared to the Committee that there was some mix up between having a National Power Policy and a National Energy Policy. While admittedly power, being a source of energy it would be covered by National Energy Policy, the Committee had to point out that Government as such had not brought out any White Paper or official document spelling out in detail even the National Energy Policy.

1.6. The Committee felt that it would have been more appropriate for Government to have brought out a White Paper on Energy so that there was a Nation-wide debate on this matter which has direct and intimate bearing on the developmental requirements. The Committee wanted Government to bring forward a White Paper on National Power Policy at the earliest which would cover *inter alia* the projections of power requirements for the next 20—25 years and the extent to which these requirements would be met by hydel, thermal and nuclear power, etc. The Committee recommended that the White Paper might be placed in time before Parliament so that there was well informed discussion both inside and outside the House before the National Power Policy was crystallised on the basis of a national consensus, and the schemes for power for the Sixth Plan were at least formulated in that perspective.

1.7. In their replies (November 1978) the Ministry of Energy have stated: "The Committee's observations are noted."

1.8. As already mentioned, a Working Group had been constituted in September, 1977 to recommend a power programme for the period upto 1982-83 and outline a broad perspective of power development upto the end of 1987-88 keeping in view the aspect of geographical distribution of resources and their optimum utilisation. The Working Group had made a comprehensive review of the power supply situation in the country and the problems faced by the power supply industry in meeting the growing demands for power and outlined a strategy for power development. The basic objective of the power

development programme was to achieve self-sufficiency and utmost reliability in power supply in all parts of the country in the shortest possible time.

1.9. The Working Group recommended a detailed power programme upto 1982-83 and a broad perspective of power development for the succeeding five period. The main focus of the programme was to ensure adequate power supply to meet the power demand as projected in the 10th Annual Power Survey.

1.10. The power programme envisaged in the Draft Five Year Plan 1978—83 is mainly based on the strategy outlined by the Working Group though the programme has been scaled down consistent with the demand projections of the Planning Commission conforming to the overall strategy of economic development set-out in the Plan.

1.11. The Working Group has been reconstituted to review the power programme for the period 1978—83 and extend it by one year. The Working Group will, in the process of its review, reconsider the strategy outlined by it and modify it to the extent necessary.

1.12. The Ministry added that in view of the dynamic nature of the planning process in the field of power development and the fact that the policies and strategies adopted from time to time are made available to all forums,, there may not be any need for a special white paper to be brought out at this stage. However, the Government will keep in view the recommendations of the Committee for consideration at a future date.

1.13. In regard to the White Paper on National Energy Policy, it may be mentioned that the Planning Commission have constituted a Working Group on Energy Policy to develop a perspective for the next 5 to 15 years and recommend appropriate policy measures for optimal utilisation of available energy resources. The terms of reference of the Working Group are:

(a) to estimate the perspective energy demand in the different sectors of the economy and regions of the country by 1982-83 and a decade thereafter;

(b) to survey the present and perspective supplies of energy;

(c) to recommend measures for optimum use of available energy resources; and

(d) to outline the national policy for the next five years, fifteen years and the longer term conservation policy.

The recommendations of the Working Group, when finalised, would form the basis of review of the energy policy where necessary.

1.14. The Committee are not convinced by the arguements advanced by the Ministry against the need to issue a White Paper on National Power Policy at this stage.. The Committee, would like to reiterate their recommendation that a White Paper on National Power Policy may be brought out by Government giving projections of power requirement for the next 20—25 years and the extent to which these requirements would be met by hydel, thermal and nuclear power etc., and the White Paper be placed before Parliament at the earliest so that there is well informed discussion both inside and outside the House before the National Power Policy is crystallised on the basis of a national consensus.

Transmission|Distribution Losses

Recommendation (Sl. No. 44, Para Nos. 3.46 to 3.61)

1.15. The Committee found to their dismay that since 1970-71 the losses instead of coming down had been rising every year. In 1971-72 they were 18.75 per cent, compared to 17.5 per cent in 1970-71, then rose to 19.94 per cent in 1972-73 registered further increase in 1973-74 when it stood at 20.46 per cent and further rose to 20.48 per cent in 1975-76.

1.16. The Committee were not convinced by the claim made by Government that "the percentage increased in losses during these years have shown a downward trend in spite of large scale rural electrification and pump set energisation programme indicating thereby that the measures taken had the definite impact in arresting substantial increase in losses." They felt that the losses were very high and with effective measures could be brought down considerably. The Committee, therefore, recommended that Government should take determined measures to bring down the losses to 14 per cent which is the suggested limit to which losses could be reduced at the earliest so that more power is available for agriculture and industrial purposes from the existing systems.

1.17. In their replies (November 1978), the Ministry have stated that the transmission and distribution losses reported by the States include a substantial amount of energy unaccounted due to theft,

wrong metering and incorrect billing. The States have been urged from time to time to take necessary steps for preventing the pilferage of energy as well as for improving the distribution systems with a view to reducing losses resulting from over-loading, poor power factor, etc. etc. Financial assistance to States for system improvement projects have also been provided through the REC. As a result of various measures—Administrative and Technical—taken by the States, the losses (inclusive of thefts) have been reduced from 20.48 per cent in 1974-75 to 19.92 per cent (provisional) in 1976-77.

1.18. The principal reasons, for increase in the losses, due to implementation of accelerated programme of rural electrification are as follows:—

"(i) In the transformers, two types of losses occur. The first is directly proportional to the current drawn by the consumers and is called as "Copper Losses". The second type of losses known as 'Iron Losses' is independent of the quantum of current drawn by the consumers. The rural loads being seasonal have a poor load factor and as such, the losses in transformers are relatively more as compared to the transformers feeding urban loads which have higher load factors.

(ii) Agricultural and agro-based industrial loads form the bulk of the rural demand. The motive power for these loads is provided through induction motors. Since in most cases the capacity of the induction motors is not properly chosen, they are only partially loaded for most of the time. This results in consumption of power at a very low power factor leading to increase in losses.

(iii) When large scale rural electrification programme is sought to be implemented with limited resources, it often leads to over-extension of the distribution system as a result of which the rural system are over-loaded and thereby result in higher system losses."

1.19. The Committee find that in spite of certain steps stated to have been taken to reduce the transmission|distribution losses, there is hardly any improvement in the position. The loss of 19.92 per cent in 1976-77 is still much higher than that in 1970-71, when it was 17.5 per cent. The Committee are not satisfied with the reasons given by the Ministry in justification of such high losses. They

would like to reiterate their earlier recommendation that determined measures should be taken to bring down losses to 14 per cent, which is the suggested limit to which the losses could be reduced.

Setting up of National|Regional Grids

Recommendation (Sl. No. 52, Para Nos. 4.28 to 4:30)

1.20. The Committee had in their 39th Report (1972-73) recommended that long range planning for the inter-State|Regional Grids should be devised keeping in view the fact that not only the State System should completely be integrated to form regional grids, but also these grids get adequately inter-connected to form a National Grid, with attendent economic gains to the community at large.

1.21. In their 16th Report (1977-78) the Committee were distressed to note that in an important matter such as establishment of regional grids, Government should have allowed such a long time to elapse and even then the preliminaries for setting up such grids had not been cleared. The Committee desired the Government to expedite matters and set up the Regional Grids within the shortest possible time and take necessary steps, to inter connect these grids to form a National Grid ultimately, so that the periodic power famine in certain regions could be overcome.

1.22. In their reply (November 1978) the Ministry have stated that the requirements for setting up the Regional grids are construction of inter-State transmission lines and setting up of Load Despatch Centres at th Regional and State level.

1.23. With a view to fostering the accelerated development of inter-State|Regional lines, it was decided to treat these projects as Centrally Sponsored Projects from the beginning of the fourth plan and give 100 per cent loan assistance to the States outside the State Plan ceiling. Up to March 1978 loans totalling Rs. 73.63 crores have been released to various States. Under this programme, so far 22 projects involving 2068 circuit km of 220 kv lines and 710 circuit km of 132|66 kv lines have been constructed and 19 projects involving 1347 circuit km of 220 kv lines and 816 circuit km of 132|66 kv lines are under various stages of construction.

1.24. As regards the setting up of the Load Despatch Centres at regional level, these are already operating on an interim basis in all the regions except the Southern Region, where a permanent Despatch Centre equipped with System Diagram Board, Telecom-

munication and Telemetering facilities has been set up. As regards, the setting up of the permanent load despatched centres, the original sanctioned schemes for the Northern, Western and Eastern Regions provided for a microwave communication system to be owned and to be operated by REBs. The P & T Deptt. did not agree to sanctioning the microwave system for REBs. and this led to the revision of the entire project Report. The change of building site for RLDC in the Northern Region from Badarpur to Hauz Khas and the acquisition of land for the RLDC buildings in Western and Eastern Regions also contributed to the delays. The Project Reports for RLDC in Northern Western and Eastern Regions have since been revised.

1.25. Global tenders for load despatch equipment under IDA Transmission Credit were opened on 13-12-1978. The tenders are being analysed. The detailed purchase orders for the equipment are likely to be placed by the end of October, 1978 and the delivery of the equipment is likely to be completed by October, 1980. The installation, testing and commissioning of the various items of equipment in the Northern and Western Regions will take another one year and thus the RLDCs are expected to be operational by the end of 1981.

1.26. In the case of Eastern Region, while the same procedure is being followed, the scope of the RLDC project involves certain works to be carried out in the State Power Systems (*i.e.* between the Power Station|substations and State Load Despatch Centres). Further, the construction of building for RLDC which has been entrusted to CPWD will take about 9 months more compared to the time taken by them for the construction of similar buildings in Northern and Western Regions, because pile-foundations have to be provided considering the soil conditions. Thus the RLDC in the Eastern Region is expected to be operational by the end of 1982.

1.27. The implementation of Phase I of the RLDC in the Southern Region is complete. The despatch functions on a permanent basis have been started from the permanent RLDC building equipped with mosaic system diagram board, PLCC teleprinting and telemetering equipment. The LFC equipment covered under Phase II has been received and is being installed. It is expected that Phase II of the scheme will be commissioned by early 1979.

1.28. The Committee had as early as 1972-73 recommended that long range planning for the inter-State|regional power grids should be

devised to set up ultimately not only the regional grids but also the national grid. They regretted to note in their Sixteenth Report (1977-78) that in an important matter such as establishment of regional grids, Government should have allowed such a long time to elapse without clearing even the preliminaries for setting up such grids. The Committee had urged the Government to expedite matters so as to set up regional grids and national grid in the shortest possible time.. The Committee note that though the Ministry have initiated action to set up inter-state transmission lines and regional load despatch centres with a view to setting up regional grids, the action seems to be proceeding at a rather slow pace. If the works proceed at this pace, it will be many years before the regional grids and the national grid become a reality. The Committee would like the Ministry to accelerate the pace of action on all points so as to complete all works expeditiously and set up the regional and national grids at the earliest.

Rural Electrification

Recommendation (Sl. No. 55 Para Nos. 5:15 to 5:17)

1.29. The Committee had noted that out of a total number of about 5.76 lakh villages in the country, according to 1971 census, about 3.5 lakh villages have a population of less than 500.

1.30. While the Committee had appreciated that the pace of electrification of villages had picked up momentum in recent years, they could not help pointing out that much leeway was yet to be made. In percentage terms, the number of villages electrified upto July, 1976 works out to about 33 per cent. The Committee, therefore, urged that Government should redouble their efforts in the direction of covering most of the villages within the shortest possible time.

1.31. In their replies (November 1978) the Ministry have stated that according to the latest available information 2,19,644 villages (38.1 per cent) were electrified upto 31-7-1978.

1.32. Steps are being taken to electrify more and more villages as expeditiously as possible within the availability of resources. The draft Five Year Plan (1978—83) envisages electrification of one lakh additional villages. The Plan provides for an allocation of Rs. 1450 crores for Rural Electrification in the country. This is in addition to Rs. 300 crores, which is expected to be made available from Financial Institutions.

1.33. The Committee note that the percentage of villages covered by rural electrification has risen from 33 in 1976 to 38.1 in 1978 and one lakh more villages are proposed to be electrified during the Plan period 1978—83. The Committee cannot over-emphasize the importance of accelerating the pace of rural electrification in the context of national development. The Committee hope that Government would continue to make in intensive efforts and succeed in covering the maximum number of villages within the Plan period.

National average of village electrification

Recommendations Sl. Nos. 59, 60 (Para Nos. 5.48 to 5.51)

1.34. The Committee had noted that the national average for village electrification in 12 States was below the national average of 33.7 per cent. Among these 12 States, Sikkim, Meghalaya, Tripura, Assam and Manipur had percentages varying from 5.1 to 12, while Bihar, Orissa, Rajasthan, West Bengal and U.P. had percentages varying from 32.1 to 28.7. Madhya Pradesh had a percentage of 17.7 and Nagaland 20.2.

1.35. The Committee urged that the Central Government should take up this matter with these State Governments at the highest level and stress the need for accelerating the pace of rural electrification and come forward with positive assistance to these States both in the matter of providing resources and in formulation of schemes for rural electrification, so that the wide gap in the percentage of rural electrification among the various States was narrowed down at the earliest.

1.36. The Committee had been informed that the Rural Electrification Corporation had been giving special consideration and high priority for projects for electrification in under-developed and backward areas. The Committee urged that Central Government and the REC should extend liberal assistance to the backward States so that the pace of rural electrification is accelerated and they come upto the level of mohe advanced States.

1.37. In reply the Ministry have stated that even though the States, which are backward in the matter of rural electrification, have by and large continued to lag behind the All India average in this regard, these States also have made steady and significant

progress. The present level of electrification in these States is as follows:—

Sl. No.	Name of State	Present level of Village eletrification as on 31-7-1978
1	Assam	10·1%
2.	Bihar	27·8%
3.	Madhya Pradesh	24·0%
4.	Manipur	12·1%
5.	Meghalaya	9·3%
6.	Nagaland	26·0%
7.	Rajasthan	30·2%
8.	Orissa	30·3%
9.	Sikkim	22·8%
10.	Tripura	9·8%
11.	Uttar Pradesh	31·3%
12.	West Bengal	31·0%

1.38. With a view to reducing the regional imbalances, rural electrification was taken up as a part of the Minimum Needs Programme (MNP) in the Fifth Plan in order to supplement the resources of the States and to ensure that by the end of the Plan period, atleast 30—40 per cent of the rural population in each State was covered with this facility. Loan assistance under this programme is made available to the States on relaxed terms and conditions. By the end of Fourth year of the Fifth Five Year Plan all States, except Assam (27.4 per cent), Meghalaya (20.9 per cent), Sikkim (15.8 per cent), Tripura (26 per cent) and Union Territories of Arunachal Pradesh (11.6 per cent) and Mizoram (10.8 per cent) had achieved the target of 30—40 per cent of rural population being covered by electricity.

1.39. The programme is also covered under the Revised Minimum Needs Programme (RMNP) in the Five Year Plan 1978—83. The criteria for implementation of the programme has, however, been modified. While the MNP in the Fifth Plan envisaged 30—40 per cent of rural population in each State to be covered with electricity the RMNP envisages electrification of atleast 50 per cent villages

in all States during the next ten years 1978—88. 40,000 villages are proposed to be electrified under this programme during the Five Year period 1978—83. An amount of Rs. 250 crores has been provided in the Draft Five Year Plan 1978—83.

1.40. It is expected that with this exclusive allocation of funds the level of electrification in backward States will be improved considerably.

1.41. The Committee are informed that even though the twelve States, which were backward in the matter of rural electrification have by and large continued to lag behind the All India average, these States have made steady and significant progress. By the end of Fourth year of the Fifth Five Year Plan, all States except Assam (27.4 per cent), Meghalaya (20.9 per cent), Sikkim (15.8 per cent), Tripura (26 per cent) and Union Territories of Arunachal Pradesh (11.6 per cent) and Mizoram (10.8 per cent) had achieved the target of 30.40 per cent of rural population being covered by electricity. The Committee hope that with the provision of adequate funds during the Five Year Plan (1978—83), the level of electrification in backward States will considerably be improved. The Committee trust that no effort will be spared to raise the level of rural electrification in the backward States so as to reduce the wide gap in rural electrification in these States and the other States.

Review of Tariff

Recommendation Sl. No. 68 (Para Nos. 5.100 to 5.102)

1.42. The Committee in their 16th Report observed that except for Kerala and Delhi, large industrial consumers paid less tariff for electricity consumption than the small industrial consumers. In States like Karnataka, Maharashtra, Uttar Pradesh and West Bengal, the difference in tariff was in fact as much as 10.30, 8.84, 8.2 and 9.16 paise per unit. The Committee also found that contrary to the claim of the Ministry of Energy that the tariffs for agricultural consumers were generally lower than other categories of consumers, the agricultural consumers in States like Gujarat, Haryana, Jammu and Kashmir, Karnataka, Maharashtra, Uttar Pradesh and West Bengal paid more tariff than the large industrial consumers. The Committee felt that if any real break through is to be made in encouraging agricultural consumers to utilize electric energy for agricultural purposes, the present tariff schedules would have to be made reasonably economical for them. The Committee further

felt that it was high time that a review of the tariff charged by different State Electricity Boards from different categories of consumers was made, keeping in view not only the viability of the Boards but also the paying capacity of different categories of consumers. The Committee recommended that such a re-appraisal should be done at the earliest and new norms and guide-lines evolved in regard to the electricity tariffs to be charged from different cotegories of consumers.

1.43. In their reply (November 1978) the Ministry have stated that as regards the observation of the Committee that except for Kerala and Delhi, large industrial consumers pay less tariff for electricity consumption than the small industrial consumers, it may be mentioned that when electricity is to be supplied to a consumer, the power generated is to be transformed in the sub-stations to appropriate voltages and transmitted over extensive transmission lines before it can be supplied to the consumer. This not only involves loss in the process but also in cost such as interest on investments, depreciation and operation and maintenance. If power is to be supplied to a smaller consumer who takes power at lower and medium voltages, transformation will have to take place in several stages and transmission and distribution lines of different voltages will have to be laid. In the case of large industrial consumers who take power at high or extra high voltages, the investments to be made are considerably lower as there is no need to put up LT distribution lines or sub-stations. As installations consume more energy, the cost on account of transmission unit of energy consumed is further reduced. Normally tariffs are required to be formulated in such a manner as to reflect the cost. In almost all cases, the larger industries subsidise, at least partially, the cost involved in supplying energy at low voltages to small scale industries and agriculture.

1.44. According to the Electricity (Supply) Amendment Act, 1978 the State Electricity Boards are required under Section 59, to earn a surplus after meeting all the expenditure chargeable to revenue and taking into account the loan amortization liabilities and accruance from depreciation. In case the Boards are required to reduce the tariffs to agriculture, it may be necessary to provide sub-ventions to the Board under Section 63 of the Electricity (Supply) Act so as to enable them to meet the objectives outlined in Section 59. Such a step is all the more necessary in view of the poor financial condition of many of the Boards. This matter was also discussed in the last Conference of State Power Ministers held in January, 1978. It was recognised during the discussions that the State Governments/State Electricity Boards may take appropriate steps, such

as timely completion of power Projects, maximising power generation by effecting improvements in the performance of the plants and strengthening man-power planning etc., as all these factors would contribute significantly towards improving the financial performance of the Boards.

1.45. The Committee are not satisfied with the explanation offered by the Ministry in justification of charging higher power tariff from small consumers. The Committee feel that the present power rates should be made reasonably economical for the agriculturists and small consumers. The Committee, therefore, reiterate their recommendation that it is high time that a review of the tariff charged by State Electricity Boards from different categories of consumers is made at the earliest keeping in view not only the viability of the Boards but also the paying capacity of different consumers, and new norms and guide-lines evolved in regard to the electricity tariffs to be charged from different categories of consumers.

Hot Line Training Centres

Recommendation (Sl. No. 94, Para Nos. 8.56 and 8.57)

1.46. The Committee in their 16th Report had noted that out of the two Hot Line Training Centres only the training centre at Bangalore had been reopened and it had started functioning from August 1975. The Committee also noted that Government proposed to establish a Hot Line Training Centre in the Northern Region itself as early as possible, and that this Centre would impart training in Bare Hand Method which was stated to be a modern method and had the advantage of eliminating the use of live line tools and increasing the degree of safety. The Committee had urged the Government to expedite the opening of this Centre. They had also recommended that training in the 'Bare Hand Technique' might also be started at the Bangalore Centre at the earliest.

1.47. The Ministry in their replies (November 1978) have stated that the Hot Line Training Centre has been set up at Bangalore to impart training to the engineers and technicians of various electricity boards in the techniques of live-line maintenance of overhead transmission lines. A provision of Rs. 32.84 lakh has been made for HLTC, Bangalore, in the Annual Plan for 1978-79. In the Bare hand techniques it may be mentioned that two distinct practices seem to be in vogue *viz.* North American continental and Russian. A decision, on the practice to be adopted to suit our conditions would be taken after a study of these two in detail.

1.48. The Committee find the Ministry's reply incomplete in that the Ministry have not informed the Committee about the progress

made in the setting up of the Hot Line Training Centre in the Northern Region. The Committee would like the Government to take an early decision about the most suitable of the two Bare Hand techniques for Indian conditions and introduce training in the selected technique in Hot Line Training Centre at Bangalore at the earliest. The Committee would also likely to reiterate that the proposed training centre in Northern Region may also be set up expeditiously.

Implementation of recommendations

1.49. The Committee would like to ephasize that they attach the greatest importance to the implementation of the recommendations accepted by Government. They would, therefore urge that Government should ensure expeditious implementation of the recommendations accepted by them. In case where it is not possible to implement the recommendation in letter and spirit for any reason, the matter should be reported to the Committee in time with reasons for non-implementation.

1.50. The Committee would also like to draw attention to their comments made in respect of replies of Government to recommendations at Serial Nos. 2, 13, 24, 33, 45, 47, 66 and 84 (Chapter II). They desire that Government shoud take action in pursuance thereof and furnish the requisite information to the Committee, wherever specifically called for.

1.51. The Committee also desire that final reply in respect of the recommendation contained in Chapter V of this report may be furnished to the Committee expeditiously.

CHAPTER II

RECOMMENDATIONS/OBSERVATIONS THAT HAVE BEEN ACCEPTED BY GOVERNMENT

Recommendation (Sl. No. 1, Para Nos. 2.21 to 2.26)

The Committee have already noted in their 39th Report (1972-73) the short falls in the Plan targets during the four Plan periods. As against the additional power to be created to the tune of 1.40 MKW, 3.43 MKW, 7.04 MKW, 6.88 MKW and 4.13 MKW; during the First Plan, Second Plan, Third Plan and the three Annual Plans (1966—69) and the first three years of the Fourth Plan respectively, the actual achievements amounted to 1.12 MKW, 2.74 MKW, 4.52 MKW, 4.12 MKW and 2.60 MKW in each of these Plan periods, resulting in a shortfall to the tune of 20,36, 35, 38 and 37 per cent respectively. These shortfalls the Committee have already noted, resulted mainly from the delay in delivery of plant and equipment by manufacturers and delay in construction work at site which was due to delayed supply of essential materials like steel, cement and paucity of funds etc.

The Committee, however, find that the situation during the Fifth Plan is still more distressing, though on different account. The Committee note that in accordance with the Ninth Annual survey, the Fifth Plan had envisaged an additional capacity of 16.5 MKW. The Committee are, however, concerned to find that the target was first lowered to 12.42 MKW and reduced further to 11.90 MKW. According to the Ministry this is stated to be due to the overall slackening of the economy of the country during the last few years resulting in lowering of growth rate in industrial sector. The Committee are concerned to note that the progress in rural electrification was also slow which in turn had its repurcussions on the growth trends to some extent. All these factors are stated to have contributed towards slackening of demand for power from the major consuming sectors, and consequently the targets for creation of power generation capacity laid down for the Fifth Plan had to be lowered.

The Committee are not convinced that the lowering of the target for additional capacity for power generation to be added in the Fifth Plan was at all justified. If previous experience is any

guide, the demand for power both for industry and agriculture has been significantly in excess of availability with the result that the industry had to suffer long-term shut-downs/chronic/under-utilisation of capacity and agriculture also suffered for want of availability of electrical energy for tube-wells, pump-sets etc.

The Committee would like to recall the observations made by them in paragraph 22 of their Thirtieth Report (Third Lok Sabha, March 1963):

> "Since the cost of installing 1 KW of electric power is but a fraction of the capital investment required to utilise it, it is obvious that if in any eventuality power generating capacity was under-utilised it would entail less overall loss to national economy than would be the case if productive machinery was to be rendered idle on account of power deficit. Past experience, in India and other countries, clearly shows that in a developing economy the demand for power nearly always outruns the available supply. Planning for surplus power is, therefore, essential for achieving an optimum rate of growth in the country. The Committee strongly recommend that power being a primary source of energy should be one step ahead of industrial and other requirements."

The Committee reiterate the above observations which are as pertinent today as they were in 1963 and regret to have to point out that Government do not appear to have learnt the requisite lesson from the persistent power shortages which have plagued the industrial and the agricultural sectors in successive plans and retarded the pace of development.

The Committee are inclined to think that the reduction in two stages of the target for addition of electric power from 16.5 MKW to 11.90 MKW has been done with a view to cover up the shortfall that is likely to occur during the Fifth Plan as compared to the original targets envisaged.

Reply of Government

The observations of the Committee are noted for guidance in the future. Efforts are being made continuously to improve the processes of planning for power development and project implementation with a view to enable formulation of realistic power programmes consistent with the growing demands for power and to ensure their achievement. The experiences of the past as pointed out by the Committee from time to time are being kept in view in evolving future

programmes. It may be mentioned in this connection that the steps taken in the past few years, have resulted in accelerated tempo of power development. The annual rate of addition of installed generating capacity in the four years of the Fifth Plan averaged about 1850 MW against 830 MW achieved during the Fourth Plan. The tempo is proposed to be increased substantially to an average annual rate of about 3700 MW in the five year plan 1978—83, the main objective being to achieve adequacy in power availability as quickly as possible. Adequate advance action had been initiated on the projects to be commissioned beyond the Fifth Plan period with the result that the projects included in the power programmes for 1978—83 are mostly sanctioned ones and the few that are yet to be sanctioned have been provided funds for their start in 1978-79. As such, the plan for 1978—83 has started in a better state of preparedness than the earlier plans. The process of monitoring construction of projects has also been improved considerably and streamlined enabling identification of bottlenecks well in time so that they could be removed. The measures that have been and are being taken should enable acceleration of the tempo of power development as envisaged in the next five years.

[M|O Energy (Deptt. of Power) O.M. No. 40(9)|78-Coord, 18, Nov., 1978].

Recommendation (Sl. No. 2, Para No. 2.27)

The Committe find that the reasons now adduced for the delay in the execution of hydel projects and other projects are largely the same as have been repeated from one plan period to the other. This is also indicative of the fact that hardly any perceptible improvement has been effected in the institutional arrangements for survey, investigation, preparation of Project reports, communication of sanction execution etc. with the result that the Projects drag on for year rendering the entire Planning for Power unrealistic. The Committee cannot too strongly emphasise that at least now Government should improve the institutional arrangements to see that large Power Projects which have a vital role and contribution to make towards Power development are selected and implemented in the field in accordance with the Plan programme and no slippage on any account is allowed to take place. The Committee have dealt with this matter in greater detail in separate sections dealing with hydel, thermal, nuclear Power Project.

Reply of Government

The surveys and investigations of hydro-electric/multipurpose schemes are carried out in most of the cases, by the concerned State

Authorities. In some specific cases such as in the middle reaches of the Chenab in J&K, Arunachal Pradesh, Sikkim and the Andaman & Nicobar Islands, Central Agencies have also been carrying out the investigations. It has been generally observed in the past that due to constraint of availability of fiscal resources, the State authorities have not been able to give necessary priority for investigation of potential hydro-electric sites. The CEA/Deptt. of Power have been impressing upon the State authorities the need for taking up of investigation of hydro-electric schemes and completing them as a time-bound programme so that a shelf of schemes is kept in a state of readiness for implementation. Central assistance in the form of grant-in-aid has also been provided during the last few years for carrying out investigations in the hilly/backward areas of some States. In order to carry out investigations inadequate detail, the Central Water Commission/Central Electricity Authority have issued guidelines to State Authorities for investigations of major irrigation and hydro-electric projects and also a manual for investigation and preparation of Project reports. These guidelines are useful of carrying out comprehensive investigations and for preparation of project reports and for processing the projects expeditiously for techno-economic clearance. The Government of India had set up a Committee under the Chairmanship of Chairman, CWC, to examine the procedure for investigating and implementing multipurpose and hydro-electric projects. The terms of reference of this Committee were (i) to identify the contents of the Detailed Project Report, (ii) indicate the extent to which investigations should be carried out before investment decisions can be taken, (iii) lay down the details of preparatory works necessary for obtaining sanction of multipurpose and hydro-electric projects, and also the procedures for according such sanction etc. The recommendations of the Committee which were received recently are being studied.

[Ministry of Energy (Deptt. of Power) O.M. No. 40/9/78-Coord. dated 18 Nov., 1978].

Comments of the Committee

The Committee may be apprised of the follow-up action taken on the recommendations made by the Committee set up to examine the procedures for investigating and implementing multipurpose and hydro-electric projects.

Recommendation (Sl. No. 3, Para No. 2.28)

The Committee are distressed to note that there has been a revision of priorities in taking up certain projects, mainly hydel projects,

during this period. These projects which were envisaged to come up by the beginning of the Fifth Plan, failed to come up because investigations were not completed in respect of these projects or detailed project reports in respect of these were not upto the mark.

Reply of Government

The observations of the Committee are noted. Steps are being taken to ensure inclusion of adequately investigated schemes in the power programme so that it does not ordinarily become necessary to change their priorities or targets after their inclusion in the power programme.

[Ministry of Energy (Deptt. of Power) O.M. No. 40/9/78-Coord dated 18 Nov., 1978]

Recommendation (Sl. No. 4, Para Nos. 2.52, 2.53)

The Committee note that the hydro-electric potential of the country was estimated at 42 million KW at 60 per cent load factor. This assessment is based on the Survey conducted in the fifties. The Committee were further informed that if the latest topographical and hydrological data for all the river basins and the latest technological advances on the possibilities of hydro-electric development are taken into account, the hydro-electric potential of the country would be much higher.

Though two decades had elapsed since the last assessment, it is only now that Government hed felt the need for up-dating the old survey. The Committee undestand that a scheme has been drawn up for setting up of a specialised cell in the Central Electricity Authority for up-dating the hydro-electric potential of the country through a comprehensive national survey and that the Ministry of Energy has conveyed the sanction of the scheme during October, 1977 at an estimated cost of Rs. 30 lakhs. This work of re-assessment is scheduled to be completed in five years. The Committee feel that considering the fact that the re-assessment of hydro-electric potential has already been delayed for long, at least the period of completing the assessment now being undertaken should be as short as possible so that a long term perspective plan for development of Power could be drawn up earlier in the light of the re-assessment. They would therefore urge the Government to examine the feasibility of completing the work in shorter time. The Committee would also like to stress that while making the assessment of the potential, the possibility of development of small and micro level projects should not be lost sight of. The Committee

would urge that this aspect should be specifically included as one of the items to be looked into while assessing the potential.

Reply of Government

For the survey and re-assessment of the hydro-electric potential in the country, a Cell has since been created in the Central Electricity Authority and its work is in progress.

The feasibility of completing the work of re-assessment of the H.E. resources in the country in the shortest possible time has been examined. It is to be noted that the volume of the work involved was kept in view in proposing a limit of 5 years for its completion. However, on the basis of investigation carried out/being carried out by the various State authorities etc., schemes other than those indicated in their earlier assessment are also being identified and where feasible, being taken up. The responsibility of the development of small hydel projects would also be kept in view while re-assessing the H.E. resources.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18th November, 1978].

Recommendation (Sl. No. 5, Para No. 2.54)

It is an admitted fact that the hydro-electric power is ultimately cheaper as its operating and generation costs are exceedingly low, apart from the other benefits accruing from the fact that the hydro-electric projects are in the nature of multi-purpose projects. Beside, it is very clean energy compared to coal and is replenishable. In view of these obvious advantages of developing the hydro-electric potential the Committee had expected that there should have been speedier development of this potential. The Committee however find to their regret that hardly 13 per cent of the potential as assessed in the fifties had been utilised till the end of the Fourth Plan and only about 27.9 per cent of the potential is now either developed or under development.

Reply of Government

There can be no disagreement with the need for or desirability of speedily developing the Hydro-electric potential in the context, *inter alia,* of availability of resources.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18th November, 1978].

Recommendation (Sl. No. 7, Para No. 2.56)

The Committee need hardly point out that the availability of power is one of the key factors in the development of a region or a

State. It is, therefore, no wonder that the States with less availability of power are comparatively backward. The Committee would like Government to pay serious attention to this aspect and take necessary remedial measures to correct the imbalance in the development of hydro-electric potential in the various States. They would like that priority in the Development of hydro-electric potential should be given to those States which are lagging far behind in such development in spite of having promissing potential and wide gap between requirements and availability of power.

Reply of Government

The development of Hyrdo-electric resources in a particular State| Region depends upon factors such as the availability of un-developed potential, expected power requirements of the State|Region, the economics of generation, *vis-a-vis* other alternative modes of generation, readiness of the schemes for implementation etc., subject to these, priority is being given to developing the hydro potential of States where there is scope for exploitation and techno-economically viable schemes are available.

[Ministry of Energy (Department of Power) O M. No. 40|9|78-Coord., dated 18th November, 1978].

Recommendation (Sl. No. 8, Para No. 2.57)

The Committee are neither impressed with these figures nor the progress made. Apart from the fact that the present utilisation is even less than 30 per cent of the potential, it has to be remembered that the potential itself is based on survey carried out nearly two decades earlier. The Committee cannot but express their deep disappointment that the progress in harnessing the hydro-electric protential in the country should have been so slow. The Committee hope that in the new perspective plan for development of power hydro-electric power development would find its due place and Government would take concerted measures to step up the development of hydro-electric potential in the various States of the country.

Reply of Government

The development of hydro-electric potential is a vital element in our planning for power and hydro-electric schemes estimated to yield an additional benefit of 13 MKW have been tentatively identified for the period 1983-84 to 1988-89.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18th November, 1978].

.. **Recommendation Sl. No. 9, (Para Nos. 2.64, 2.65, 2.66)**

The Committee are glad to note that an award of Krishna Water Disputes Tribunal has been given in May, 1976 and it has become possible to accord approval to some of the projects in the Krishna basin. The proposals submitted by the Andhra Pradesh authorities in regard to Nagarjuna Sugar Project which envisaged installation of one 110 MW conventional generating unit and 4 reversible turbine units at the dam-site power house have been accorded techno-economic clearance by the Central Electricity Authority in August, 1976 and have since been sanctioned by the Planning Commission. Similarly, agreement has also been reached on sharing the waters of Godavari basin, and this would enable processing of Upper Indravathi Multi-purpose project and other projects in this basin. The Committee hope that no time should now be lost in clearing all the remaining projects which were held up due to Krishna and Godavari Water dispute.

The Committee also note that sharing of waters of the Narmada basin is still under adjudication of the Narmada Water Disputes Tribunal, whose award is awaited and that the development of the Navgam and upstream projects in Narmada Valley would depend upon the decision of the Tribunal about the height of the Navgam dam and allocation of waters. The Committee hope that the Tribunal award would be available soon and thereafter no time would be lost in finalising the various hydel projects in the Narmada Valley.

The Committee further note that an agreement has also been reached between the Punjab and Himachal Pradesh authorities for carrying out extensive works at the existing Shanan and Bassi Power Stations. These schemes have now been sanctioned by the Planning Commission.

Reply of Government

Two separate Tribunals namely the Krishna Water Disputes Tribunal and the Godavari Water Disputes Tribunal were set up in April, 1969. The Krishna Water Disputes Tribunal gave its final report in May, 1976, which was published in the Gazette of India on 31st May, 1976. Accordingly, the projects in the Krishna basin are being considered for clearance within the framework of the Award of the Krishna Water Disputes Tribunal.

Regarding the Godavari Water Disputes Tribunal, the adjudication proceedings are continuing. Efforts are also being made by the concerned Sates to reach an amicable settlement through mutual negotiation. As such, in the case of the Godavari Basin, only those

projects, which are covered by the mutual agreements reached amongst the party-states, pending the award of the Godavari Water Disputes Tribunal can be considered at this stage. The remaining projects in this Basin would be considered after the final report of the Tribunal becomes available.

The Narmada Water Disputes Tribunal has given its report to the Government of India on the 16th August, 1978. Copies of the report have been sent to all the concerned the Centre Governments and the Departments at the Centre the Centre and the State Governments to seek explanations or guidance from the Tribunal within the stipulated period of 3 months of the decision, as provided under the Inter-State Water Disputes Act, 1956. After investigating such references, if any, the Tribunal may forward a further report and the decisions of the Tribunal shall then be published by the Govenrment in the Gazette of India and shall be final and binding on the parties to the dispute and shall be given effect to by them.

After the final decision becomes available, it would be possible to consider the clearance of various projects, within its framwork.

The Shanan and Vassi extension projects are under construction.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord. dated 18th Nov., 1978].

Recommendation Sl. No. 10 (Para Nos. 2.67 to 2.70)

The Committee are, however, distresed to note that some hydro-electric projects have been held up in the Northern region on account of inter-State disputes. The Committee note that no solution is in sight as regards the Mukerian, Anandpur Sahib and UBDC Stage II projects in spite of the repeated efforts made by the former Ministers of Energy. The Committee also note that the Thien Dam located on river Ravi is held up due to similar disputes between Himachal Pradesh, Punjab and Jammu and Kashmir and also the States of Haryana and Rajasthan. The Committee view this state of affairs as extremely unfortunate as the power potential available in the region would remain untapped for long period for want of suitable solutions to the disputes.

The Committee are dismayed over the help-lessness exhibited by the Central Government so far in the whole affairs of inter-state River Water Disputes and the indifference shown by the State authorities concerned in a matter which has a vital bearing on the economic well-being of the people of the area. The Committee

would like Government to give this matter their most serious consideration. The Committee at the same time would appreciate if Government would evolve very early a framework of a broad policy in regard to these disputes, based on justice and keeping in view the economic interests of the people so that amicable solution could be found to these problems without delay and a major bottleneck standing the way of development of hydel projects and economic prosperity of the regions and welfare of the people could be removed.

The Committee would like the Central Government and all other authorities concerned to redouble their efforts to see that an amicable and workable solution is found about the sharing of power from the proposed Thein Dam Hydel Project so that it could be taken up for implementation without any further delay.

The Committee note that Government have already taken a decision that UBDC Stage II project which envisages installation of there 15 MW Turbo generators would be taken up independently of the Thien Dam project. The Committee expect the Government to take the necessary follow-up action so that at least UBDC Stage II project is taken up for speedy implementation to meet the gap between the known requirements and availability of power in the regon.

Reply of Government

Many of the rivers in India are inter-State in character and differences|disputes do sometimes arise between the concerned States in planning|operation of projects on such rivers. Some cases have aspects peculiar to themselves. To the extent possible, efforts are made to resolve differences/disputes through negotiations or through reference to an Arbitrator. Disputes which cannot be resolved through negotiations or arbitration, are referred for adjudication to Tribunals constituted under the Inter-State Water Disputes Act, 1956. The question of finalising appropriate institutional arrangements and necessary legislation for evolving a National Water Policy has also been under consideration of Government. The position in regard to the projects referred to in the preceding Recommendations of the Estimates Committee, is indicated below:—

The inter-State dispute on Thein Dam Project has, by and large, since been resolved. The sharing of water amongst the States of Punjab, Haryana and Rajasthan has since been decided. The three concerned States where the project is located or whose lands would get submerged have come to an understanding regarding sharing of power from this project. At the meeting held on 3-10-1977, under

the Chairmanship of the Prime Minister when the Chief Ministers/ Irrigation and Power Ministers of Punjab, Rajasthan, Himachal Pradesh and Jammu and Kashmir were present, it was decided that work on the Thein Dam Project should start immediately and that the Government of India would in due course consider the claims of Rajasthan and Haryana regarding sharing Thein Dam Power. The Punjab Government has initiated preliminary action for the construction of the Thein Dam. The UBDC Stage II is a part of the Thein Dam Power Scheme.

As regards UBDC Stage II, Anandpur Sahib and Mukerian Hydel Projects, a meeting was held by the Minister of Energy in 1976 with the Chief Ministers/Ministers of Irrigation and Power of the Punjab, Rajasthan and Haryana, and it was decided in principle that issues concerning the sharing of cost and benefits amongst the concerned States in respect of UBDC Stage II, Anandpur Sahib and Mukerian Hydel Projects could be referred to a Referee. While the Governments of Haryana and Rajasthan and Himachal Pradesh have communicated their willingness to accept the findings of the Referee as final and binding on that State. In respect of Mukerian and Anandpur Sahib Hydel Projects, the Chief Minister of Punjab has stated that there is no need to refer the issues to an Arbitrator on the basis of the policy initiated by the Prime Minister at the meeting held on 3-10-1977 that the States which generate power by making non-consumptive use of water should be entitled to that power and that the entitlement of any other State would flow from the Statute or from the specific agreement. It is contended by Punjab that these two projects are located within the territory of Punjab State, non-consumptive use of water through Punjab would be made for power generation and there is neither any statute nor any specific agreement in which Haryana, Rajasthan would be entitled to share such power generated. On the contrary, the contention of the other States is that power benefits from Anandpur Sahib and Mukerian Hldel Projects should be shared by Punjab, Haryana and Rajasthan and power from UBDS Stage II should be shared by Rajasthan and Punjab because:—

(i) Anandpur Sahib Project was made possible by the construction of Beas Sutlej Project diverting Beas waters to Sutlej.

(ii) Mukerian Project was made possible with the storage of water after the construction of Pong Dam. (Beas Project Stage II)

(iii) UBDC Stage II would be possible after the construction of proposed Thein Project, and

(iv) Haryana and Rajasthan are partners in Beas Project (BSL and Pong Dam) and have shared the cost. Rajasthan is also a partner in the proposed Thein Dam Project.

The Ministry of Energy has again referred the matter to the Government of Punjab, requesting them to convey their concurrence to the appointment of an Arbitrator and to abide by the findings.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord. dated 18th Nov., 1978].

Recommendation Sl. No. 11 (Para Nos. 2.73 and 2.74)

2.73. The Committee note that a number of hydel projects have been sanctioned after 1973-74 and in most of the cases, orders have also been placed for generating, plants, to yield benefits during the Fifth and Sixth Plans. The Committee further note that a number of them have already been taken up for construction. The Committee would like to emphasise that investigations of the hydro projects which are likely to yield benefits, beyond the Sixth Plan may also be initiated and the projects kept ready in the pipeline so that the same could be taken up without let or hinderance at the appropriate time.

The Committee find that most of these hydel projects which have been taken up would result in addition to power only in the Sixth Plan, the only exception being Nagarjunasagar Conventional Unit of 110 MW which is expected to be commissioned during 1977-78. This again underlines the need for longer perspective planning so that the selected hydel schemes are taken up for implementation well in time to contribute towards the augmentation of power generation to meet the requirements. The Committee have been stressing the need for perspective and detailed planning for the next ten to fifteen years and they desire that learing from experience Government should see that hydel projects in particular are got investigated and a shelf of schemes go ready for selection and implementation so as to achieve in thime the Plan targets envisaged.

Reply of Government

Power development is a long gestation activity and the advantages of long-term planning for power development are well recognised.

In fact, while amending the Electricity Supply Act recently to reorganise the electricity supply industry, the need for preparation of perspective plans for power development had been kept in view. The Central Electricity Authority has been entrusted with the responsibility of developing a sound, adequate and uniform national power policy in relation to the control and utilisation of national power resources.

Recognising the fact that power generation schemes take 5 years and more to complete, exercises relating the power programme during the Sixth Plan had been initiated as soon as the Fifth Plan was finalised and advance action on a number of schemes which would provide benefits during the Sixth Plan period had been initiated. The exercises carried out for the Sixth Plan had kept in view the requirements of power during the Seventh Plan also.

After the Government's decision to terminate the 5th Plan in the current year and formulate a plan for the period 1978—83, a Working Group was set up to prepare a power programme during the period 1978—83, keeping in view the perspective for the period 1983—88. The Working Group had identified not only schemes for benefits during the period 1978—83, but also schemes which would have to be taken up for benefits during the subsequent 5-year period. This was done with a view to initiate advance action on them to derive timely benefits according to the needs. They had also indicated the requirements of funds for advance action on new generation schemes to be taken up during the period 1978—83 to derive benefits during the subsequent 5-year period. The report of the Working Group formed the basis for the formulation of the power programme in the Draft Five Year Plan 1978—83.

The draft Five Year Plan for the period 1978—83 has placed adequate emphasis on the development of the power sector. The power programme for the five year period 1978—83 envisages addition of installed generating capacity of 18,500 MW. It also broadly indicates the generation requirements at the end of the subsequent 5-year period, *i.e.*, 1983—88. One of the features of the power programme for the period 1978—83 is that all the schemes included in it are sanctioned projects. A number of long gestation schemes for benefits during 1983—88 have also been sanctioned recently. These include mainly long gestation hydro projects and would contribute about 10,000 MW.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord., dated 18th November, 1978]

Recommendation (Sl. No. 12, Para Nos. 2.75 and 2.77)

The Committee learn that there is no obligation under Sec. 30 of the Electricity (Supply) Act to refer the hydel projects to National Committee on Environmental Planning and Co-ordination for clearance while such a clearance in the case of thermal power project is obligatory. Even so, the Committee observe that the National Committee on Environmental Planning and Co-ordination had suggested the dropping of the Silent Valley Hydro Electrict Project of Kerala on account of sub-mergence of virgin forest and ecological disturbances. The objection was raised by the NCEPC in 1977 at a time when an amount of Rs. 52.21 lakhs had been reportedly spent on preliminary works of the project and the project itself was sanctioned as early as February 1973. The Committee learn that the NCEPC (National Committee on Environment Planning and Co-ordination) had stated that they would be able to reconcile themselves for the execution of the project of the project provided certain safeguards were taken in respect of environment protection during the course of execution, operation and maintenance of the project. Kerala Government have agreed to provide these safeguards and the matter has been taken up with the Department of Science and Technology.

The Committee appreciate the need to ensure that the execution of Power Projects does not lead to ecological disturbances. What the Committee would like to emphasise is that in order to expedite the entire Process of approval, sanction and execution a hydel Project should be taken up simultaneously with the Central Electricity Authority for clearance from techno-economic angle and with the NCEPC for clearance from ecological angle so that once the project is cleared from techno-economic angle, there is no further hold-up in the process of sanction and execution. The Committee would like the procedure in this regard to be settled after due consultation with the State Government Planning Commission and the Department of Science and Technology and necessary guidelines issued to all concerned in the preparation and approval of future projects.

Reply of Government

The question of scrutinising HE projects in regard to the environmental angle has been under the consideration of the Government. It has now been decided that clearance of major irrigation projects and HE projects from the environmental angle should be insisted upon before the schemes are taken up for execution. The Department of Science and Technology (DST) have now constituted an Environmental Appraisal Committee which includes not only the representatives of the concerned Ministries but outside experts also. The DST have finalised the check-list to collect the necessary information

for examining the project from the environmental angle and it has been decided that the check-list should be circulated to all State Governments with the direction that data as per this list be furnished as an integral part of the project reports at the time of the submission of the report to the Central Electricity Authority for clearance. The Central Electricity Authority will circulate a copy of the project report to the DST immediately after the receipt of the report so that examination by the DST could proceed in parallel with technical scrutiny. The views of the DST would be taken note of by the CEA at the time of according techno-economic clearance. In case, there are differences of view between the CEA and DST, efforts would be made to reconcile the differences.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18th November, 1978].

Recommendation (Sl. No. 13, Para Nos. 2.80, 2.81)

The Committee note that one of the reasons for over-runs in the construction and commissioning of power plants has been the inadequacy in investigations and preparation of detailed project reports. The Committee note that guide lines have been issued by the Central Water and Power Commission for investigations for river valley projects. A manual for investigation and preparation of project report for power generation projects has also been prepared by the Central Electricity Authority. A Committee has also been appointed to lay down parameters for the preparation of detailed project report.

They desire that the Committee appointed by Government to revise the guidelines should complete their work with expedition so that the authorities can be provided firm guidance for investigating and preparing the schemes along the approved lines to facilitate selection of projects for the Sixth Plan.

Reply of Government

The Committee has since submitted its report and the same is under examination.

[Ministry of Energy (Department of Power) O M. No. 40|9|78-Coord., dated 18th November, 1978]

Comments of the Committee

The follow-up action taken in the matter on the basis of the recommendations of the Committee may be communicated in due course.

Recommendation (Sl. No. 14, Para No. 2.82)

The Committee need hardly point out that there should be a monitoring arrangement in the Central Water and Power Commission to continuously review the guidelines in the light of experience so as to supplement and modify them as necessary and notify them to the authorities concerned contemporaneously to bring about the necessary improvement. The Committee also suggest that these guidelines may be reviewed at least once during each Plan period so that these could provide firm and up-to-date basis for investigation and preparation of schemes along approved lines for the succeeding Plan period.

Reply of Government

The Committee's suggestion regarding reviewing the guidelines for investigation and preparation of schemes along the approved lines has been noted. In September, 1976, the Department of Power had set up a Committee for laying down the details of preparatory work necessary for obtaining sanction for multipurpose and hydro-electric projects identifying the contents of detailed project reports, indicating the extent to which investigations should be carried out and designs finalised determining materials and equipment requirements and recommending the extent to which infra-structural activities should be undertaken before an investment decision is taken. The Department of Irrigation also set up a Committee in October, 1977 to review the guidelines for investigation and preparation of river valley projects prepared and issued to the State Governments in 1972. This Committee is expected to submit its report shortly.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18th November, 1978].

Recommendation (Sl. No. 15, Para Nos. 2.97 to 2.103)

The Committee in their 39th Report (1972-73) had recommended that Government should examine the feasibility of locating the new thermal stations at the pitheads in the large economic interest.

The Committee have been informed during evidence that locating the new thermal stations at the pitheads would be economical from the point of view of cost of generation of power as the cost of generation per unit at the pithead would be 9 paise as compared to 18 paise at other places.

The Committee are glad to note that in implementation of their recommendation, Government appointed a Committee to identify sites nearer to the pitheads and study their suitablity from the

point of view of techno-economic factors for setting up larger thermal power stations of 2000 MW capacity approximately in different regions. The Government Committee was also asked to inspect sites in the following regions:—

(i) One site in Maharashtra;
(ii) two sites in Madhya Pradesh;
(iii) one site in Andhra Pradesh; and
(iv) two sites in Eastern region.

Keeping in view the suggestions made by the aforesaid Committee and other considerations, Government, it is state, propose to establish in a phased manner one large thermal station each in Northern, Western, Eastern and Southern regions, Feasibility reports have already been prepared for Singrauli (2000 MW), Korba (2000 MW), Farakka (2000 MW), Ramagundam (1000 MW) and Neyveli (1000 MW). Proposals have been forwarded to the World Bank for financial assistance. The Committee note that negotiations with the World Bank in respect of Phase I of the Project at Singrauli are in an advanced stage. The Committee during evidence have been informed that an assistance of 150 million dollars would be available for Phase I. The Committee would like to be apprised of the outcome of the negotiations, and the progress made in the setting up of the Singrauli Project.

As regards the Projects at Korba, Ramagundam and Farakka, the Committee observe from the replies given in answer to Questions to Lok Sabha on 1-3-78 that Government have accorded approval for setting up super thermal power stations for the projects at Korba and Ramagundam and in respect of the super thermal project at Farakka, the project report has been prepared and is being appraised in he Central Eelectricty Authority for techno-economic clearnace and thereafter the project will be processed for an investment decision.

The Committee would like to emphasise that implementation of all these projects may be taken up in accordance with the relative priorities fixed, keeping in view the need for development of the various regions and in accordance with a time-bound programme.

As regards the setting up of small thermal Power Plants, the Committee have been informed that as a policy, Smaller Stations are not being encouraged in view of the need for rapid growth of power in the country, but the installation of small units by certain industries or at certain other locations on merits is not ruled out and

such proposals are considered as and when received on their own merits. The Committee hope that proposals for establishment of small Thermal Power Plants, will be considered only on merits.

Reply of Government

The status of execution of the various Regional Thermal Power Stations in the Central Sector is given below:

Singrauli Super Thermal Power Project

Singrauli Station is located in the proximity of Singrauli Coalfields. The scope of first phase of the power project for which Government approval has been accorded, includes installation of three generating units of 200 MW each. The Station will have an ultimate capacity of 2000 MW. The first 200 MW generating unit at Singrauli is programmed for commissioning in 1981-82 and the remaining two 200 MW generating units during 1982-83. An IDA loan and US $150 million is made available for financing the project. Firm allocations of power from this project has been made to constituent States in the Northern Region. Progress has been made in acquiring the land for Singrauli power project. A major portion of the levelling and grading work has been completed. Work on infrastructure development and pilling is in progress. Orders for the main plant and equipment have been placed. Cotract for the other equipment packages and construction works are being progressively awarded.

Korba Super Thermal Power Project

The Korba Project is located in the vicinity of Korba coalfields in Madhya Pradesh. Approval has been accorded for establishment of 1100 MW capacity ($3\times200 + 1\times500$) station in the first stage. The ultimate capacity of the station would be 2100 MW. The first 200 MW generating unit is expected to be commissioned in 1982-83. The subsequent 200 MW units will be commissioned in 1983-84 and the first 500 MW unit in 1984-85. Firm allocation of power from Korba has been made to Madhya Pradesh, Maharashtra, Gujarat and the Union Territory of Goa. This project also is partly financed by World Bank and an IDA credit of US $ 200 million has been agreed to. Progress has been made in acquiring the land for the project. Infrastructure development is in progress. Bids have been invited for the supply of main plant and equipment. Preparation of specification and tendering for other equipment is being progressively carried out.

Ramagundam Super Thermal Power Project

Ramagundam Super Thermal Power Project is located in the Singareni coalfields in Andhra Pradesh. The first phase of the project envisages installation of 110 MW consisting of three 200 MW units and unit of 500 MW. The ultimate capacity of this station

will be 2100 MW. The first 200 MW generating unit is programmed for commissioning in 1982-83 and the subsequent two 200 MW units will be commissioned at an interval of six months each thereafter. The first 500 MW unit is scheduled for commissioning in 1984-85. The power output from Ramagundam Thermal Power Station would be allocated to the States and the Union Territories in the Southern Region. Action has been initiated by NTPC for land acqusition and construction of infrastructure facilities. The project has been posed for IDA financing and negotiations for lending have yet to take place.

Farakka Super Thermal Power Station

The Central Electricity Authority have accorded techno-economic clearance for establishment of a large thermal power station with 1100 MW capacity at Farakka in the Eastern Region. The project is being processed for an investment decision.

Neyveli Second Mine-Cut

Approval has been accorded for installation of three generating units of 210 MW each at Neyveli in the Southern Region utilising the lignite available from the proposed second mine-cut. The ultimate capacity of this station would be 1260 MW. This station will be established by the Neyveli Lignite Corporation under the administrative control of Department of Coal. The first 200 MW generating unit is scheduled for commissioning during October 1981 and 2nd and 3rd units in July 1982 and April 1983 respectively.

Region. Action has been initiated by NTPC for land acquisition and Coord., dated 18th November, 1978]

Recommendation (Sl. No. 16, Para No. 2.116)

The Committee note that the thrust of research on the solar energy is towards its application to rural areas with a view to complement the other sources of energy. They have been informed that prototypes of solar pumps for drawing underground water have been developed and would be installed and tested in the field shortly. Research is stated to be under way for direct conversion of this energy into electricity. R&D efforts are also directed at solar dryers for drying agricultural produce, solar heating, solar cooling and refrigeration and solar distillation and desalination. The Committee recommend that considering the special significance this source of energy

has for a tropical and agricultural country such as ours, R&D efforts should be intensified to make a break-through in this field.

Reply of Government

The recommendation of the Committee is noted.

The integrated programme of research and product development which is being funded by the Deptt. of Science & Technology, has made significant progress. Several of the projects like solar driers, solar milk driers, solar water heaters, solar kilns, solar power units etc. have been successfully completed. Further tests are being carried on these with a view to obtain more operational data. The projects which have been successfully completed are listed in *Appendix I.* The on-going projects being funded by the Department of Science and Technology are listed in *Appendix II.* The progess and hgihlights of the R&D activities in the various areas of application of solar energy are briefly given below:

Solar collectors are basic to use of solar energy for thermal application. Several institutions are working in the field of collector technology. Flat plate collector technology for low grade application (60° to 70° C) is fairly well developed. Prototypes of flat plate collectors to yield 95° C have been built and tested as part of the 10 KW Solar Power Project. Further work is in progress for choice of the most appropriate material for use in the flat plate collectors. Work on selective coating is quite encouraging. Processes of black chrome and black nickel coatings have been developed. Further work is necessary to standardise the processes and coating techniques and to assess the performance of the coated panels under field conditions. A laboratory model of a longitudinal concentrator type collectors and tracking systems require greater support. The main problem is in the development of suitable reflecting surfaces.

Solar Cabinet type driers for drying of food grains and products have been developed by several institutions. AMUL has completed a project to utilise solar energy as a supplementary source for milk drying. Solar kilns for drying timber have been designed and developed by Forest Research Institute of India, Dehradun. The National Industrial Development Corporation have installed and tested a 10-tonne per day paddy drier.

There is considerable activity in the area of using solar energy for water heating. While the technology is fairly developed, the efforts presently are being concentrated in developing cost effective designs. A few medium and large scale water heating systems have now been installed and their performance is being monitored.

Work is in progress in utilising solar energy for space cooling and refrigeration. Among the projects in progress is the one taken up by IIT, Bombay and BHEL for utilising solar energy for cold storage.

Application of solar energy for desalination of sea water and conversion of brackish water into potable water has also been successfully developed. Considerable work has been done in this field by Central Salt, Marine and Chemical Research Institute, Bhavnagar.

Very high priority has been accorded to development of solar pumps. A number of institutions are working to develop different technologies of utilising solar energy for pumping. Laboratory models of pumps have been developed and successfully tested. The basic problem is developing a system which will be technologically simple and economically viable so that it would find acceptance in the country's rural economy.

A 10-KW Demonstration Solar Power Generation Unit has been successfully developed under a project undertaken jointly by India and West Germany. IIT, Madras, BHEL and National Physical Laboratory are associated with this project from the Indian side. The plant is, at present, undergoing trial operation for tests and collection of data. The facility will be used for experimental purposes and testing of advanced collector and other solar systems. Efforts are also underway to develop a power plant based on concentrator collector systems. Considerable further work is necessary for development of the technology for application on a commercial scale.

One of the commercial areas in which the R&D activities have not picked up is relating to storage of energy. DST is proposing to embark on a major programme in this field.

Several projects are in progress in various Indian Research and Development Organisations in the field of development of solar cells. This programme is being co-ordinated by the Central Electronics Ltd. The emphasis in these projects is to design, develop and fabricate solar cells and panels for low-cost photo-voltaic application to produce electricity directly from solar energy. Good progress has been made in the area of single crystal silicon solar cells and the Central Electronics Ltd. (CEL) has started fabricating these cells and panels in a routine manner. It is proposed to step up this activity and put the solar panels for field testing on a larger scale. Significant progress has also been made on the film CdS solar cells at IIT, Delhi and on Polycrystalline silicon solar cells at the National Physical Laboratory. Both these areas are very promising and are likely to result in low cost solar cells. The IIT (Delhi) team has reported attainment of 10 per cent efficiency with CdS solar cells but the main

problem appears to be rapid deterioration of cells unless properly encapsulated. A project on encapsulation is proposed to be taken up as this is crucial to the solar cell technology. Several new projects have been funded in the Solar Cells area and these include project on extraction and purification of solar grade silicon from rice husk (IIT, Kharagpur), and Amorphous silicon (IACS, Calcutta). CEL has prepared proposals for setting up of pilot plant facilities to produce solar cells in greater volume.

According to the proposals of the Department of Science & Technology, the programme of solar energy application is proposed to be intensified. The future plans envisage the following activities:

- improvement and modification of designs of water heating systems for domestic applications.
- field trials of solar system under development.
- demonstration programme to popularise solar devices adequately developed—water heating, grain dryers, photovoltaic pumps.
- collector testing facilities—standardisation and evaluation procedure.
- development projects on solar power plants, pumps etc.
- commercialisation of selective coating processes.
- programme on concentrator and tracking systems.
- prototype and product development centre for solar systems.
- pilot plant facilities for fabrication of solar cells.
- programme on encapsulation of solar cells.
- studies on integrated rural energy centres.
- feasibility study of solar power tower for Indian conditions.
- techno-economic studies, market analysis and forecasts.
- studies on industrial application of solar energy—heat water and low pressure steam.
- workshops and seminars on topics such as solar energy and architecture, solar energy for rural development, solar energy for industry, solar energy system economics and commercialisation of solar devices.

Many of the on-going projects will continue for periods of two to three years. Some new projects are also proposed to be undertaken.

In view of the wide difference in conditions under which solar equipment have to be operated in different parts of the country, it is proposed to undertake extensive field trials to prove the various systems that have been developed. Demonstration programmes are also proposed to be undertaken in order to educate public about the advantages of solar energy and popularise various solar energy systems. Steps are also proposed to be taken to commercialise systems which have been successfully developed in the laboratories.

[Ministry of Energy (Deptt. of Power) O.M. No. 40/9 78-Coord. dated 18 Nov., 1978].

Recommendation (Sl. No. 18, Para 2.118 & 2.119)

The Committee also note that Bio-gas yet another non-conventional source, which appears to have great potential for development particularly in rural areas. Needless to say, the use of this source of energy, can be of great help in conserving large quantities of kerosene which is being burnt in rural areas for cooking and lighting purposes and easing pressure on the demand for power in rural areas.

The Committee are informed that at the beginning of the Fifth Plan the number of bio-gas plants was about 7,000; target of one lakh plants was set for the Fifth Plan. As against this target, the number of plants set up at the end of the second year of the Fifth Plan was only 30,000. The Committee urge Government to take vigorous steps to ensure that the target set for the Fifth Plan is fully achieved by 1978-79.

Reply of Government

Bio gas technology, which serves dual purpose of production of fuel gas and Organic fertiliser through the anaerobic fermentation of cattle dung and other organic waste has been given due consideration Ministry of Agriculture and Irrigation took up initially a programme of setting up 1,00,000 gobar gas plants during the Fifth Five Year Plan period. With a view to popularise the bio-gas plants, central subsidy @ 25 per cent of the capital cost of gobar gas plants was given to the beneficiaries during the first two years and @ 20 per cent during the years 1976-77 and 1977-78. Subsidy for small plants (sizes 60 and 100 cft) was enhanced to 25 per cent and 50 per sent during 1977-78 for plants to be set up in hilly and tribal areas. Scope of the programme was enlarged to include setting up of community bio-gas plants for which central assistance @ 33 per cent of the capital cost is being given.

About 60,000 gobar gas plants are reported to have been set up during 1st four years, against the plant target of 1,00,000 plants. A target of 30,000 plants has been set up for the current financial year *i.e.* 1978-79. Concerted efforts are being taken to achieve this target.

[Ministry of Energy (Department of Power) O.M. No. 40(9)/ 78-Coord, Dated the 18 Nov., 1978].

Recommendation (Sl. No. 19, Para 2.120)

The Committee would, however, point out that the cost of setting up small size bio-gas plant which is between Rs. 3016 and Rs. 4175/- appears to be beyond the reach of a common man in the rural parts of the country. They would, therefore, urge Government to direct their efforts towards reducing the cost of setting up plants through economy in design and enable the villagers to benefit from this programme.

Reply of Government

The recommendation of the Committee has been noted. Attempts are being made to evolve a cheap and efficient design of bio-gas plants under the All India Coordinated Research Project on Bio-gas Development and utilisation set up under the auspices of the National Committee on Science & Technology and Indian Council for Agricultural Research.

The State Planning Institute, UP have, at the instance of the Deptt. of Agriculture, taken up studies on the Chinese model of Bio-gas plant at the Gobar Gas Research Station, Ajitmal (Etawah). As a result of certain modifications in the Chinese model, a new drumless design of gobar-gas plant, known as 'Janta Bio-gas Plant' has been developed. Such plants which are reported to be cheaper in installation and maintenance cost, are being experimented in U.P., Rajasthan and Haryana.

[Ministry of Energy (Department of Power) O.M. No. 40(9)/ 78-Coord, Dated the 18 Nov., 1978].

Recommendation (Sl. No. 20, Para 2.121)

The Committee would like to point out that the rapid development of the vast bio-gas potential available in the country for meeting the rural energy needs, would require establishment of large sized community type bio-gas projects. They would like Government to encourage the setting up of such large size community type bio-gas projects.

Reply of Government

In view of the various organisational and management problems associated with the setting up of large-size community-type bio-gas plants, it has been decided to set up ten large-size community bio-gas plants on Pilot basis with 33 per cent Central Subsidy during the current year (1978-79). Efforts are also being made to set up night-soil based bio-gas plants on Community basis at selected institutions such as Colleges|Schools having hostel facilities and sub-urban colonies for which cent per cent financial assistance is being given. Besides this emphasis is also being laid on the setting up of bigger size bio-gas plants at Government Farms, Dairies and Cattle breeding Farms and at other institutions wherever potentials are available.

[Ministry of Energy (Department of Power) O.M. No. 40(9)/78-Coord, Dated the 18 Nov., 1978].

Recommendation (Sl. No. 22 Para No. 2.142)

The Committee further note that there were wide disparities in the per capita consumption of electricity between the various State/areas at the end of the Fourth Plan. The per capita consumption in 1973-74 (*i.e.* at the end of the 4th Plan) ranged from 6 Kwh in Tripura, 8 Kwh in Manipur, 21.2 Kwh in Assam to 197 Kwh in [illegible]jab, 170 Kwh in Maharashtra, 154 Kwh in Gujarat. The Committee had in their 39th Report expressed distress at this persistent imbalance in the per capita consumption between the various States/areas in the Country and had recommended effective steps to be taken to reduce the disparities by providing additional installed generation capacity and building extensive transmission and distribution system in such areas. The Committee regret to observe that determined efforts do not appear to have been made in this regard They note that the additions to the per capita consumption of electricity during the Fourth Plan period were not made to the desired extent in the low per capita consumption States/areas. The Committee strongly urge that effective measures may be taken by Govt. to reduce these side disparities by according higher priority to the generation, transmission and distribution of power in such areas with potential consumption for industrial and agricultural development.

Reply of the Government

The observation of the Committee is noted. As the consumption of electricity is dependent primarily on economic activity, it is necessary to step up the economic activity in the backward regions of the country to reduce the disparities in the electricity consumption

in different parts of the country. The draft 5-year Plan has recognised the need for reduction in the inter-regional gaps in the levels of development, the standard of living and the quality of life. This is proposed to be achieved in the plan through reliance to a much greater extent on the development of agriculture, village and small industries, subsidiary occupation and related services through hill areas/tribal areas, Revised Minimum Needs and area development programmes. This would enable generation of more demand for electricity from back-ward areas. It is also proposed to take up more intensive rural electrification programmes in back-ward areas.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord. dated, 18th November, 1978].

Recommendation (Sl. No. 23, Para 2.143)

The Committee would further like to point out that lack of availability of power acts as a constraint on the growth and development of rural and semi-urban areas. It is well known that there is high consumption in metropolitan and big urban areas. The per capita consumption of electricity at Delhi and Chandigarh was 316 and 425 respectively against the All India average of 108.8 Kwh in 1975-76. The easy availability of power in these big cities has been one of the main factors for concentration of industries and employment potential in these areas resulting in migration of popula for from rural areas to these centres. The Committee consider that in the interest of development of rural and semi-urban areas, it is imperative that power is made easily available in the rural areas. They would, therefore, like Government to give high priority to make power available to these areas in the interest of integrated rural development and creating employment potential there.

Reply of Government

The observation of the Committee is noted. The draft Five Year Plan 1978—83 envisages intensification of electrification of rural areas. The programme envisages energisation of 20 lakhs pump sets and electrification of rural areas. Considering the wide disparities in the rural electrification coverage in the States it is proposed, under the revised minimum needs programme, that by 1988 atleast 50 per cent of villages should be electrified in every State and Union Territories, so that inter-regional disparities in coverage are reduced. Such coverage under the Revised Minimum Needs Programme can enable electrification of about 40,000 villages.

[Ministry of Energy (Department of Power) O.M. No. 40(9)/78-Coord, Dated the 18 Nov., 1978].

Recommendation Sl. No. 24 (Para No. 2.157 to 2.160)

The Committee note that the installed capacity of power generation was 18075 MW in 1974-75, 19855.4 MW in 1975-76, and 21567.5 MW in 1976-77. The actual power generation in these three years was 70710 Gwh, 79907 Gwh, and 89200 Gwh respectively. The Ministry of Energy have stated that a portion of the capacity goes towards statutory planned maintenance and unforeseen outages and the balance is called availability. But this available capacity could not be fully utilised because of partial losses comprising reduction in capability of the units due to outage of a single component of multiple auxiliaries, constraints in the main equipments, like Boiler, Turbine generator etc. due to temporary abnormalities in operating conditions, system, line for transformer capacity, limitations etc. Loss of capacity on these factors is of the order of 27.5 per cent. There is also the influence of the load factor i.e. the variations in the pattern of consumption due to consumer behaviour which depresses the utilisation factor. The Committee note that the national load factor for India had been 49 per cent in 1973-74, 52.3 per cent in 1974-75 and 52.2 per cent in 1975-76 which compares well with USSR (53-55 per cent), USA (50-54 per cent), France (40-44 per cent) and U.K. (40-43 per cent). The loss of about 23 per cent between the availability and generation load factor of 52.3 per cent consists of generation not possible due to system constraints such as low load, backing down of generation on account of hydro availability etc., and constraints in auxiliaries etc., and main equipment. Equipment and auxiliary losses during the first quarter of 1976-77 was almost 14.99 per cent.

The Committee have been informed that the loss of capacity due to planned maintenance, forced outage and partial unavailability during 1975-76 and 1976-77 was as follows:—

Particulars	1975-76	1976-77
1. Planned maintenance (%).	11·70	9·60
2. Forced outage (%)	12·80	12·95
3. Partial unavailability (%)	19·00	16·03
TOTAL . . .	48·50	38·58

As regards statutory planned maintenance, the Committee were also informed that the Kulkarni Committee had recommended the norms of (i) 4 weeks for boiler overhaul and (ii) 45 days for capital

maintenance of turbine as against these norms the actual average time taken in 1975-76 and 1976-77 for (i) boiler overhaul was 69 and 39 days respectively, and (ii) capital maintenance of turbine was 119 and 67 days respectively.

The Committee would like the Government to keep a careful watch on the losses arising out of forced outages, equipment and auxiliary constraints and bring them down through vigorous implementation of the measures which are stated to have been taken such as reduction in down-time, modernisation of maintenance procedures adequate preventive maintenance of units and auxiliaries and employing proper working procedures in case of forced outage to bring back the unit on out-age to service at the earliest.

The Committee are glad to note from the speech of the Minister of Energy in reply to discussion on Demands for grants of his Ministry on 14 July, 1977 in Lok Sabha that he has directed that "plant by plant review be undertaken of the forced outages, partial outages, and constraints on output of the plant by the technical experts to diagnose the problems and find urgent technical solutions. The Committee hope that the above review would be completed at an early date and the quality and performance of power stations would be improved so as to ensure maximum output from the existing capacity.

Reply of Government

The observations made by the Estimate Committee on the need for reducing down-time, modernisation of maintenance procedures, preventive maintenance, and reducing forced outage are noted. In April, 1975, Kulkarni Committee had made a number of recommendations in respect of improving the performance of thermal power stations in the country. Vigorous efforts have been made during the past 2 years to implement these recommendations, and as a result of this, considerable success has already been achieved, particularly in respect of down-time for boiler overhaul and capital maintenance of turbines. For instance, during 1976-77, the average duration for boiler overhaul has been reduced to about 39 days as against 69 days during the year 1975-76. Similarly, it has been possible to reduce the turbine maintenance time to an average of 67 days during 1976-77 as compared to 119 days during 1975-76. This progress has been maintained during the year 1977-78, the average duration of boiler overhaul being 37 days and average duration of capital maintenance of turbines being 70 days. The Central Electricity Authority is keeping a constant watch over the performance of thermal power stations in the country and all possible efforts are

being made to reduce the boiler overhaul time to 28 days and turbine capital maintenance to 45 days, as recommended by Kulkarni Committee, as early as possible.

Insofar as outages on thermal units are concerned as a result of the various steps taken, it has been possible to reduce partial outages from about 19 per cent in 1975-76 to about 16 per cent in 1976-77, which has been maintained in 1977-78. However, one area which has been a matter of concern is the forced outages on thermal units, which have been increasing from about 12.8 per cent in 1975-76 to 12.95 per cent in 1976-77 with a further increase to about 18.9 per cent in 1977-78. This increased inforced outage rate was due to the share of the indigenous units commissioned in last three years. In this connection, during the year 1977-78 a plant-by-plant review had been undertaken, as a result of which 31 generating units of various sizes in 14 thermal power stations were identified for major renovation work by multi-disciplinary teams comprising the representatives of CEA, BHEL, ILK and State Electricity Boards. These teams have identified various operational and equipment deficiencies which have been responsible for high forced outage rates and they have recommended modifications which include major equipment changes as a result of design deficiencies. The work requires prolonged shut-down of units, which is quite often not possible due to difficult power supply position in many States. Besides a large number of items of replacement have to be imported whose deliveries are long. Hence renovation work on various units is being carried out in a phased manner and out of the total of 31 thermal units, 21 units have so far been partially renovated. It is expected that once all the renovation work is completed their performance will improve considerably.

[M/O Energy, Deptt. of Power, O.M. No. 40(9)|78-Coord. 18th November, 1978]

Comments of the Committee

The Committee hope that the renovation of the remaining 10 thermal units out of 31 thermal units identified for the purpose would be completed expeditiously and the forced outage rate which has been steadily rising would be brought down to the minimum at the earliest.

Recommendation Sl. No. 25 (Para No. 2.173)

The Committee note that as against the targetted additional installed capacity of 9.26 million KW during the fourth Plan period, the actual addition was only 4.16 million KW, resulting in a shortfall of 5.10 million KW and in percentage terms, the achievement

had been about 45 per cent. The Committee observe that apart from increase in the cost of projects due to escalation in prices and increase in labour costs the other main reasons for the shortfall were inadequate investigation and deficiencies in project preparation, delays in availability of essential construction materials and funds, delays in obtaining plant and equipment and organisation/ management deficiencies. The Committee need hardly point out that with greater care in planning, greater determination to implement the schemes and necessary coordination with concerned authorities these difficulties could have been easily overcome. The Committee hope that Government have learnt the lessons from their past experience and would ensure that at least in future such shortcomings do not hold up commissioning of power plants according to the stipulated schedules and the country is not denied the availability of power which provides vital sinews for industrial and agricultural advancement.

Reply of Government

In order to ensure that the augmentation of generation capacity takes place according to schedule, several steps have been taken to identify projects and techno-economically clear them so that sanctions can be accorded in time.

Efforts are being made to ensure that only adequately investigated schemes are included in the programme. A system of monitoring projects under implementation has been organised both at the Centre and in the States. A fullfledged monitoring organisation has been set up in the Central Electricity Authority to progress projects under construction and take timely action to remove bottlenecks wherever they occur. A system of reporting progress by the project authorities has been developed to enable CEA to obtain feedback on progress of construction of civil works, supply of equipment and erection etc. The CEA and the Department of Power conduct monthly reviews of projects under construction—especially those in an advanced stage to ensure that all construction activities are according to schedule. High level meetings are also arranged by the Department of Power from time to time with the State and the project authorities, the equipment suppliers and the CEA to review periodically the status of all projects and bring about interaction between all concerned in identifying bottlenecks and finding solutions to remove them.

The main suppliers of plant and equipment M/s. BHEL have assured the timely delivery of equipment matching with the commissioning programme. BHEL have been advised to ensure that the

deliveries are sequential and there is no time lag in the delivery of the units.

In order to accelerate the tempo of commissioning of units, apart from selecting extension sites, the majority of thermal units being proposed are of the higher 210 MW size, as against 100 MW, 110 MW, and 120 MW units, commissioned during the Fifth Plan period Standardised designs, to the extent feasible are proposed to be adopted.

Efforts are also being made to improve contract management. A Technical Committee has examined the detailed ways in which contract management can be improved and time can be reduced on design and engineering. Procedure for award of contract for different activities are being reviewed to see how they could be standardised and streamlined. The Committee has also examined ways to expedite the construction procedure and accelerate the tempo of construction. The recommendations of this Committee have been made avaialble to the State Electricity Boards. A similar Committee is looking into ways of reducing construction time for hydro projects by using modern construction techniques.

The requirement of funds for the various projects under construction are also being closely monitored to ensure the completion of project activities as per schedule. It would thus be seen that several steps have been taken to expedite the commissioning of projects. The major responsibility for implementing the power development programme will, however, vest with the State Electricity Boards.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18th November, 1978]

Recommendation Sl. No. 27 (Para Nos. 2.187 to 2.188)

The Committee note that at the Centre, the monitoring of the power projects under construction in the Central and State sectors is being done by the CEA. The Committee have been informed that a proposal for setting up a full fledged construction Monitoring Organisation in the CEA has been approved. There would be three wings in this organization *viz.* Thermal Projects Monitoring Cell, Hydel Projects Monitoring Cell, each under the charge of Chief Engineer. In addition, there will be a separate Control Data Processing Cell headed by a Systems Supervisor.

The Committee need hardly emphasise the importance of construction monitoring particulary in the context of the shortfall in

achieving the power generation target in the Fourth Plan. The Committee trust that with the strengthening of the monitoring organisation at the Centre, all avoidable delays in the construction and commissioning of power projects will be eliminated.

Reply of Government

To avoid delay in commissioning of projects, effective monitoring is being done in the Central Electricity Authority as well as in the Ministry. Meetings to review progress on construction of power projects are being held, for taking appropriate action, to remove the bottlenecks.

[Ministry of Energy (Department of Power) O.M. No. 40(9)|78-Coord. dated 18th November, 1978]

Recommendation Sl. No. 28 (Para Nos. 2.189 to 2.190)

The Committee are, however, distressed to find that the arrangement for monitoring at State Electricity Board level leave much to be desired. According to the representative of the Ministry of Energy, "some of them have no full time people, while others have exclusive organisation which are not adequate in strength," and "collectively in the matter of certain instruments which are in vogue for the last few years for effective monitoring they are not fully upto date". Also, the Committee, observe that several States have set up monitoring organisations at the headquarters and only in some cases at project sites.

The Committee need hardly point out that a majority of the bottlenecks that arise in the implementation of projects could be to a very large extent avoided or remedied by timely action through effective monitoring at project level and upward and through close coordination with the Central Electricity Authority. The Committee urge the Central Government to pursue this matter vigorously with the States and ensure that proper monitoring arrangements exist for all individual projects so that no avoidable delay occurs in the commissioning.

Reply of Government

The State Governments have already been addressed, stressing the need to have effective monitoring organisation for power projects at the State level. The matter is being pursued further.

[Ministry of Energy (Department of Power) O.M. No. 40(9)|78-Coord. dated 18th November, 1978]

Recommendation (Sr. No. 30, Para No. 2.207)

The Committee note that so far as Central Hydro-electric Projects are concerned, the constitution of the Control Board for Central Hydro-electric Projects and the procedures adopted by it have helped in processing of the proposals and in issuing of formal sanctions after decisions are taken by the Control Board. The Committee hope that the work relating to the projects in the Central Sector would be processed smoothly and the plants commissioned within the target dates.

Reply of Government

It was with a view to promoting the efficient and economic implement of the Central Sector Projects that the Government of India set up the "Central Hydro-electric Projects Control Board" in July, 1970. This Board was processing the work relating to the Hydro-electric Projects in the Central Sector on a time-bound basis.

2. In 1974, in the context of the restructuring Electricity Supply Industry in the country, the Government of India decided to adopt the Company Form of Management for the execution, operation and management of Central Projects. Accordingly, for hydro projects, the National Hydro-electric Power Corporation was set up in November, 1975 under the Companies Act, 1956 and became functional in June, 1976, when the Chairman and Managing Director took charge. The National Hydro-electric Power Corporation is to plan, promote and organise an integrated and efficient development of Hydro Electric Power, in all its aspects, including planning, investigation, research, design and preparation of preliminary, feasibility and definite project, reports, construction, generation, operation and maintenance of Hydro Electric Power Stations and projects and the transmission, distribution and sale of power generated at Hydro Electric Stations in accordance with the national economic policy and objective laid down by the Central Government from time to time.

3. The Central Sector Hydro-electric Projects, namely Loktak in Manipur, Baira Siul in Himachal Pradesh and Salal in Jammu and Kashmir were placed under the charge of the National Hydro-electric Power Corporation with effect from 1-1-1977, 20-1-1978 and 15-5-1978 respectively. The Office of the Central Hydro-Electric Projects Control Board was wound up on 15-7-1978. The National Hydro-electric Power Corporation is now taking steps to gear up the

construction works for the commissioning of the Projects entrusted to it.

[Department of Power O.M. No. 40|9|78-Coord. dt. 18th November, 1978]

Recommendation Sl. No. 31 (Para Nos. 2.218 to 2.219)

The Committee note that delay delivery schedules and supply of defective equipment by BHEL is stated to be partly responsible for delay in the commissioning of power plants. They observe from the information furnished to them that the commissioning of thermal stations at Gandhinagar Kothagudam (Stage IV) Harduaganj (Stage VI), Pathrathu-III Panki and Amarkantak was adversely affected by defects in equipment supplied by BHEL or delayed deliveries of equipment. In the case of hydro-electric project also the delays in the schedule of deliveries held up the commissioning of several hydro-electric projects. For instance commissioning of Ramganga Pong, Chenani, Vaiterna, Koyna (Stage III); Ukai; Subernarekha; Loktak; Sharavathy (Unit Nos. 9-10) Lower Sileru and Gumti Projects was delayed by over 2 years on this account alone.

The Committee are constrained to observe that the continued delays in the deliveries of equipment are a pointer to the fact that there has not been the necessary coordination between the BHEL on the one hand and the project authorities|State Electricity Boards and the C.E.A. on the other. The Committee are unable to appreciate why such a vital matter was not attended to in time. The Committee would like Government to take suitable remedial steps so as to ensure that the orders are placed on BHEL well in advanced and delivery schedules worked out in a phased and realistic manner. The Committee have no doubt that through strict monitoring and effective coordination at various levels concerted measures would be taken to ensure that the supplies are made on schedule by BHEL and arrangements are made to inspect the equipments before despatch and later before installation at the projects. The Committee would like to be apprised of the concrete steps taken in this regard.

Reply of Government

In order to ensure timely placement of order, supply of material as per schedule and in proper sequence for coordination, monitoring cells in the CEA (Thermal) Hydro and transmission are taking appropriate steps. The State monitoring cells, wherever, existing are also taking suitable action in the matter. Various coordination

meetings are held between CEA, BHEL and project authorities, to decide the delivery schedule of various equipments for the power stations, and then this schedule is constantly reviewed for taking action reviewed in the Ministry of Energy as well as in CEA. Representatives from major equipment suppliers, and project are also invited for the review meetings.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord. dated 18th Novemer, 1978]

Recommendation Sl. No. 32 Para Nos. 2.232 and 2.233

The Study Group of the Estimates Committee during their visit to Lower Lagyap Project in Sikkim were informed that the Jolly Hydel Project situated about 30 Kms. away was be set with the problem of silt which resulted in damage to generators and led to development of cracks in the pen-stock which required costly repairs.

The Committee were informed during evidence that there was quite a lot of silt flow in the Himalayan rivers and in addition there were a lot of boulders which caused severe damage to turbines. The Committee would like Government to ensure that suitable safeguards are taken to obviate damage from silt and boulders to the turbines and other equipment in Lower Lagyap Project.

Reply of the Government

The Lower Lagyap Hydro Electric Project has 3 weirs namely (i) Yalichu, (ii) Rorochu and (iii) Takchmochu. The weirs have been designed as trench type having grating over the top. The clear space between the grating is 30 mm. As such, the silt and boulders of bigger sizes will not pass through the same; and hence will roll down over the weir. From each of these weirs the water is taken into the water conductor system. Before the water enters into the water conductor system, bye passes have been provided near the intake so that when the silt load in the river is more, this can be flushed out as the intake itself. After the bye pass, the water travels in the water conductor system and then enters into the desilting chamber where the velocity of water is considerably reduced. In the desilting chamber, even coarse silt is removed. Thereafter, the water travels either in tunnels or in pipes and there is no scope of any further addition of silt in the water conductor system. However, at the exit of all the tunnels, manholes with desilting pipes have been provided to take care of any silt collecting into the water conductor system. Also, the operation schedule requires that during the monsoon months, no water should be drawn from the Rorochu stream which brings quantities of silt and rolling boulders. These arrangements are being made so that the silt,

the requirements of generating capacity realistically, besides other aspects of requirements of installed capacity to meet the load demands adequately at the end of the 5-year period, matching transmission, distribution and RE programmes, funds required for the power programme and the year-wise phasing of funds, organisational capabilities to implement the power programme, adequacy of manufacturing capability of heavy electrical and other equipment and key materials etc. The precise capacity addition required during the next 5-Years will emerge from these considerations.

The Committee observe from the study carried out by C.E.A. that the projected additional capacity of 22000 MW, the on-going schemes and the sanctioned schemes would together provide 16467.5 MW and for the rest certain new hydel and thermal projects will have to be considered.

The Committee also note that the basic objective of the power plan for 1978-79 to 1982-83 is to achieve self-sufficiency in the next seven years. While the Committee welcome the objective of the Government to achieve self-sufficiency in power in the next seven years, they cannot help observing that in this field the past performance had not been inspiring or encouraging to lend optimism regarding achievement of this objective. There had been wide gaps between targets fixed and the actual achievement in Plan after Plan. The Committee have dealt with this matter elsewhere in the Report. It would suffice here to point out that all impediments noticed in the past coming in the way of achieving the declared goals will have to be ruthlessly removed so as to ensure that the targets once fixed are achieved in full without fail. The Government will have to ensure that on-going schemes and the already sanctioned schemes are completed by the target schedules which would provide as much as 16467 MW of power. The Committee need hardly emphasise that the funds for the schemes will have to be provided on an assured basis and adequate organisational capacity created and developed well in time to sustain the tempo of progress and that there should be close and strict monitoring of the project schedules in close coordination between the concerned authorities and above all an unwavering determination to achieve the targets. As regards new schemes, they should be so selected that the benefits of these schemes do become available within the seven years period.

The Committee need hardly repeat that power being the basic intra-structure for the overall development of the economy, Government would give the highest priority to this core sector and

thereby provide the necessary impetus for the rapid growth in industrial and agricultural fields.

Reply of Government

The Committee's observations are noted for guidance.

The Working Group on Power set up by the Planning Commission in 1977 to recommend *inter-alia* a power programme for incorporation in the Plan for the period 1978-83 submitted its report in February, 1978. During the deliberations of the Working Group, the representatives of the Planning Commission had pointed out that the exercise relating to the formulation of the new strategy for economic development during the period 1978-83 were being carried out in the Planning Commission and this exercise could have a bearing on the demand for power in the future. As the details of the economic projections and the targets of various sectors of the economy corresponding to the new strategy being formulated by the Planning Commission were not immediately available, the Working Group carried out its capacity planning exercise based on the demand projections of the 10th Annual Power Survey. The strategy for economic development during the five year period 1978-83 was formulated by the Planning Commission in early February, 1978. In view of the shifts in sectoral priorities, the electricity demands in 1982-83 was reassessed by the Planning Commission. The draft report of the Working Group had been prepared by them based on the capacity planning exercises already carried out and it was not possible at that stage to re-work the entire basis of capacity planning or the investment projections. The Working Group, therefore, decided that the draft report may be submitted to the Planning Commission incorporating a note from the Planning Commission outlining their views on the basis of the new exercise that had been completed. The Working Group also felt that any fresh exercise needed to re-work the capacity requirement and the corresponding requirements of investments and key-materials could be undertaken by the CEA and the Department of Power after the approach formulated by the Planning Commission on the new strategy had been considered and finally adopted. Accordingly, the Working Group finalised its report and forwarded the same to the Planning Commission.

According to the 10th Annual Power Survey, the peak demand for power at the power station bus in public utilities is expected to increase from about 18,200 MW in 1977-78 to 30,390 in 1982-83. The corresponding energy requirements at the power station bus are estimated at 100,470 Mkwh in 1977-78 increasing to 168,392 Mkwh

in 1982-83. The Working Group had carried out a detailed capacity planning exercise—regionwise and it considered that an addition of about 22600 MW over the anticipated installed generating capacity of about 24400 MW in utilities (26600 MW including non-utilities) at the end of March, 1978 would be required to meet the demands as projected by the 10th Annual Power Survey. The Working Group had also indicated a complementary programme of Transmission and Distribution and Rural Electrification. It had also worked out the phased requirements of funds for the power programme during the period 1978-83. The Planning Commission in their note to the Working Group had indicated that the All India demand for power (including non-utilities) at the consuming end in 1982-83, according to their projections would be 128838.50 Mkwh (123038.50 Mkwh in utilities only). They had, further, indicated that for meeting this demand a total generating capacity of 41750 MW will be needed in 1982-83 in utilities.

Subsequently, the Planning Commission finalised the draft five year plan 1978-83. The electricity consumption demand in 1982-83 had been reassessed by the Planning Commission at 128.8 billion units requiring a generation of 167 billion units in the light of the changes in priorities and projected rates of growth in the various consumption sectors. Assuming that the total All India installed generating capacity at the commencement of the 5-year plan 1978-83 would be about 26,000 MW (including non-utlities) the programme envisaged an addition of about 18.500 MW to generating capacity during the plan period to take the total All India installed generating capacity in the country to about 44,600 MW (comprising 42100 MW in utilities and 2500 MW in non-utilities) at the end of the Plan period.

The installed generating capacity at the end of March, 1978 was about 26000 MW; comprising of about 23775 MW in utilities and 2225 MW in non-utilities. The power programme envisaged in the 5-year plan 1978-83 has identified the schemes in the various regions for deriving benefits of 18.500 MW during the plan period. The important feature of the programme is that the schemes included consist of on-going schemes and schemes which had either been cleared or those for which funds have been provided for starts in 1978-79. These schemes included in the programme are in a better stage of readiness than before and only such schemes which have a reasonable certainty of being commissioned have been included in the programme. The programme has also kept in view

the perspective for power development during 5-year period beyond 1983 and provides for advance action on schemes to be commissioned during this period.

Adequate steps have been taken by the Government to continuously monitor the progress of the projects under construction and also take necessary action to ensure their commissioning according to schedule. Measures designed to accelerate implementation of power projects are also being considered from time to time and introduced.

The Planning Commission in the context of the rolling Plan concept, reconstituted the Working Group on Power to review the power programme during 1978-83 and extended it by one more year. The Working Group is presently engaged in this task.

The importance of power development to the overall development is well-recognised and the power sector has been given increasing importance in the successive plans. This would be evident from the table given below:—

		Total outlay	Outlay on power	%age
		(Rs. in crores)		
III Plan	(Actual)	8576·5	1252·3	14·6
3 Annual Plans	(Actual)	6625·4	1212·5	18·3
IV Plan	(Actual)	15778·8	2931·7	18·6
V Plan	(Outlay)	39322·0	7016·0	17·84
1974-75	(Actual)	5038·6	941·0	18·7
1975-76	(Actual)	6496·1	1195·7	18·4
1976-77	(Anticipated)	8070·5	1484·3	18·4
1977-78	(Outlay)	9965·4	1890·3	19·0
1978-79	Outlay)	11649·2	2217·2	19·0
Five Year Plan (1978-83)	(Outlay)	69380·0	15750·0	22·7

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord. dated the 18th November, 1978]

Recommendation Sl. No. 38 (Para Nos. 3.15 to 3.17)

The Committee note that in pursuance of the recommendation made in their 39th Report (1972-73), regarding advance action to be taken to finalise the generation and load demand of various regions and undertaking extensive studies to decide the important trunk lines within the States as well as the inter-State/Regional

lines, Government are stated to have completed power flow studies corresponding to the load and generation conditions envisaged in 1980-81 and identified important trunk transmission lines at 220KV and 400KV to be constructed in the States as well as in the inter-State/Regional lines for all the regions.

The Committee further note that a Task Force Transmission and Distribution Programme for the Fifth Plan had been set up to take into account the programme and details of power generation and system load in the Fifth Plan and beyond. The task force had made a number of recommendations relating to building up planning and design capabilities in the CW&PC (now CEA) and the State Electricity Boards, and data collection. The Committee note that the Central Electricity Authority is being re-organised and strengthened with a view to enabling it to effectively guide and promote the power development programme in the country of which transmission and distribution is an integral part. A separate organisation has been created in the Central Electricity Authority for undertaking power system studies and framing guidelines for systems planning in respect of the transmission network. A separate post of a member (Power System) has been created in the Central Electricity Authority.

The Committee have been informed that though generally, the transmission network is ready for evacuation of power by the time generating stations are commissioned, there have been cases where the construction of the transmission lines has not progressed according to schedule. The Committee are surprised that in a country which has been in the continuous grip of power famine, leading to halting growth in the industrial and agricultural sectors, a situation should have been allowed to develop in which the transmission net work did not progress according to scheduled resulting in delayed evacuation of power from the generating stations. That such cases should have arisen at all is an ample proof to show that in the scheme of power development, transmission/distribution systems have not been properly integrated.

Reply of the Government

There have been a number of cases where construction of transmission lines have not progressed according to the schedule. But this did not result in all cases in delay in the evacuation of power from the generation station. A Directorate have been set up in the Central Electricity Authority to monitor construction of various transmission lines, to take possible remedial measures, for removing the bottlenecks. Similarly the State Electricity Boards

have also been requested to pay special attention to the timely energisation of transmission lines.

One of the main causes for delay in energisation of the line, has been the delay in the issue of P.T.C.C. clearances. With a view of expediting these clearances, it has been decided to delegate authority in this regard, to State Level Committee to deal with cases upto 132 KV, and for voltages above this will be handled by the National Level Committee.

[Ministry of Energy (Department of Power) O.M. No. 40(9)/78-Coord. dated the 18th November, 1978]

Recommendation Sl. No. 39 (Para No. 3.18)

The Committee note that the power systems organisation is proposed to be strengthened to undertake studies on high voltage transmission system and distribution planning. They desire that these studies may be undertaken at an early date to facilitate efficient and ecomnomic execution of high voltage transmission and distribution schemes.

Reply of Government

The Power System organisation is being progessively strengthened. Since April 1978, 51 posts of technical officers have been sanctioned. The first phase of the Long term system Planning Studies has since almost been completed and detailed Regional Planning Studies have been undertaken.

[Ministry of Energy (Department of Power) O.M. No. 40(9)/78-Coord. dated the 18th November, 1978]

Recommendation Sl. No. 40 (Para No. 3.19)

The Committee note that for creation of suitable organisation at the Centre to coordinate the procurement and supply of key material and equipment, Government have a cell dealing with the timely availability of controlled and non-controlled items required for transmission and otherwise. The Committee stress that the cell responsible for dealing with the supply of key materials should maintain greater coordination with the State Electricity Board and assist them in timely procurement of materials for transmission and distribution systems.

Reply of Government

The State Electricity Boards are primarily responsible for the procurement of scarce material required for the implementation of their programmes.

The State Electricity Boards are also in touch with the cell in the Central Electricity Authority dealing with controlled and uncontrolled items, required for transmission and distribution, whenever they experience and difficulty in getting these in the requisite quantity. The State Electricity Boards have been again requested to maintain close Liaison with Central Electricity Authority.

[Ministry of Energy (Deptt. of Power) O.M. No. 40(9)/78-Coord. dated the 18th November, 1978]

Recommendation Sl. No. 41 (Para No. 3.20)

The Committee note that the Task Force for Transmission and Distribution Programme in their report had also recommended that the Trunk Transmission lines at 220 KV and above proposed to be taken up during the period 1974-75 to 1978-79 might be finalising in consultation with the States' representatives and that the construction and completion of the various links should be planned so as to strictly match with the commissioning dates of the connected generation schemes. The Committee note that these transmission lines had been finalised in consultation with the State Electricity Boards. and construction and completion of these lines had generally been planned in such a way that they matched with the commissioning of various generating units. The Committee would like a close watch to be kept on the actual execution of the programmes for the construction of the transmission lines and distribution net work so that there are no slippages and their completion is synchronised with if not completed well ahead of the commissioning of the concerned generation schemes.

Reply of Government

The construction of transmission lines meant for evacuation of power from generating stations commissioned during 1976-77 and 1977-78 was monitored. The construction of these lines were generally completed in time and no difficulty in evacuation of power from newly constructed power stations was experienced.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord. dated the 18th November, 1978]

Recommendation Sl. No. 42 (Para No. 3.24)

The Committee note that a power systems Monitoring Directorate has recently started functioning in the Central Electricity Authority to monitor the progress of the trunk transmission lines and inter-State/Regional lines under construction and to render assitance to the States in removing bottlenecks, if any, so as to ensure

the timely completion of these lines. The Committee would like to judge the working of the Monitoring Directorate by the results it achieves of ensuring that the transmission lines for the projects under construction are completed well before the commissioning of the projects.

Reply of Government

The Power System Construction monitoring Directorate was set up in December 1976. It is entrusted with monitoring of construction of all the trunk transmission lines of 220 KV and above, as well as construction of all the Inter-State Transmission Lines and transmission lines required for evacuation of power from the generating stations. Since the setting up of the Monitoring Directorate 3348 km of transmission lines were completed in time during 1977-78 as compared to 2110 km. in 1976-77.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord. dated the 18th November, 1978]

Recommendation Sl. No. 43 (Para No. 3.25)

The Committee note that necessary power system planning studies have already been initiated in so far as the transmission programme for the Sixth Plan is concerned and that the States are being associated with these studies at appropriate stages with a view to enable them to simultaneously formulate their plan proposals within the overall framework of EHV net work evolved. The Committee note that advance action has been taken for planning the transmission programme for the Sixth Plan in consultation with the State Authority. They have no doubt that such an arrangement should enable the formulation of well thought out transmission programmes and their clearance and implementation in time.

Reply of Government

The first phase of the system planning studies with a view to identify the 400 KV lines and the principal 220 KV transmission lines required in the Sixth Plan have been substantially completed in February 1978. The results of the study were discussed with the States and the requirement of 400 KV and principal 220 KV lines finalised. The States have been advised to prepare the project proposals and submit these to the Central Electricity Authority for formal clearance and for approval of the Planning Commission. Meanwhile, the States have also been advised to take advance action for procurement of materials, route survey, land acquisition, etc.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord. dated the 18th November, 1978]

Recommendation Sl. No. 45 (Para No. 3.62)

The Committee are also surprised to note that so far, no study has been carried out to determine the optimum level to which the losses in transmission/distribution can be reduced. The Committee would suggest that Central Government should urge each State Government to determine, after a study in depth, the optimum level to which such losses could be reduced in the power systems and take concerted measures to reach this level.

Reply of Government

The States have been advised to carry out necessary detailed studies for determining the optimum level to which the losses in distribution system can be reduced. Gujarat, Haryana and Uttar Pradesh States Electricity Boards have already initiated detailed computer studies for determining the optimum level to which the distribution System losses could be reduced. The other State Electricity Boards are also organising similar studies. The State Electricity Boards have been addressed to expedite completion of the studies and also to simultaneously initiate action to reach the minimum level of transmission losses, as per studies.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord. dated the 18th November, 1978]

Comments of the Committee

Consolidated results of the studies may be communicated to the Committee at an early date.

Recommendation Sl. No. 46 (Para No. 3.63)

The Committee note that already the Central Government are extending loan assistance through the rural Electrification Corporation for strengthening and improving the systems. The Committee feel that what is required now is the formulation of time-bound programme by each State urgently to bring down the losses of the optimum level on the basis of the guidelines issued by Government and to take concrete and concerned measures to implement such programmes. The Committee would like to be apprised of the details of such schemes drawn up by each State Government/ State Electricity Board and the steps taken to implement the schemes.

Reply of Government

A statement showing the details of schemes drawn up by each State Government/State Electricity Board and the steps taken to implement the schemes is enclosed (Appendix III).

The State Electricity Boards have been advised to identify the worst areas in respect of distribution losses and prepare system improvement schemes for such areas. Considering the dimensions of the task and the large investment required for the purpose, the objective of bringing down the line losses to an optimum level can be achieved in a phased manner only.

The System Improvement schemes are expected to be completed in two years. The implementation of these schemes is expected to save 130 MU of energy every year which approximately corresponds to a generating capacity of approx. 24.5 MW.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord. dated the 18th November, 1978]

Recommendation Sl. No. 47 (Para No. 3.64)

The Committee would also like to reiterate their earlier recommendation regarding making responsible an officer of the level of a Divisional Engineer for watching and reporting the performance of the system under his control in respect of losses, and would urge the Government to take up the matter with the State Governments State Electricity Boards in this behalf.

Reply of Government

In pursuance of the suggestion made by the Central Electricity Authority several States have already set up special units under the charge of a Divisional Engineer or an officer of the appropriate level to study the performance of their systems on a continuing basis. These units are monitoring the losses on each feeder by metering the outgoing energy. To ensure correctness of these meters, periodic checks are also being carried out.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord. dated the 18th November, 1978]

Comments of the Committee

The State Government/State Electricity Boards, which have not yet set up any special units under the charge of a Divl. Engineer may be persuaded to do so early.

Recommendation Sl. No. 48 (Par Nos. 3.65 and 3.66)

The Committee would also like the Central Government to review the steps taken by States in preventing pilferage or theft of power and urge upon them to strengthen the vigilance machinery and provide for technical safeguards to prevent tampering with meters etc.

The Committee regret to observe that the thefts of transformers and other Departmental materials continue to occur on large scale in spite of the measures stated to have been taken. In terms of value of the materials stolen the Committee found that it was as high as Rs. 19.46 lakhs in West Bengal, Rs. 12.79 lakhs in Haryana, Rs. 10.10 lakhs in Tamil Nadu and so on in the year 1975-76. The Committee feel that it is high time that concerted measures are taken in close concert with the State Police authorities to prevent such thefts. The Committee would also suggest that necessary technological innovations should be found by which removal of transformers or their parts is made difficult if not altogether impossible.

Reply of Government

With a view to preventing pilferage or theft of power, vigilance squads have been set up in a number of States, to carry out surprise checks on consumer meters and to replace non-working consumers meters. In order to minimise theft of energy, the following actions have been taken by a number of States:—

(i) Cut outs are being provided after meters.

(ii) Meters only having current and potential coil links, inside the meter, and not in the terminal block are being used.

(iii) Double compartment meter boxes are being used in case of commercial consumers.

(iv) Only PVC wires are being used for services.

(v) Special type of sealing pliers are used for sealing meters and cut outs.

[Ministry of Energy (Department of Power) O.M. No. 40(9)|78-Coord. dated the 18th November, 1978]

Recommendation No. 49 (Uara No. 4.16)

The Committee note that Load Despatch Centres which are required for "Controlling a system comprising a number of generating stations, a grid net-work and load centres" have been set up

in all States except Jammu & Kashmir, Himachal Pradesh, Haryana, Assam, Manipur, Meghalaya, Nagaland and Tripura. In these States the need for such Load Despatch Centres has not been felt so far. The Committee hope that Government will periodically review the question of setting up such Centres in these States also in the light of the future development, and take speedy measures to establish such centres if the situation so warrants.

Reply of Government

The observations of the Committee have been noted. Commissioning of New generating stations as well as development of transmission and distribution system is reviewed periodically and the concerned State Governments advised to establish load despatch centres, as and when required.

[Ministry of Energy (Deptt. of Power) OM No. 40(9)|78-Coord. dated 18th Nov., 1978].

Recommendation Sl. No. 51 (Para No. 4.22)

The Committee note that a National Despatching Centre which would be responsible for coordination of the activities of the Regional Load Despatching Centres and regulation of inter-Regional Power exchanges is proposed to be established in Delhi. Phase I of this Centre is estimated to cost Rs. 67.47 lakhs, which includes a provision of Rs. 12 lakhs made in the annual plan for 1977-78 for purchase of land. According to anticipations the total estimated cost of the scheme under Phase II would be Rs. 6-7 crores though the estimates for Phase II have not been prepared as yet. The funds for this Centre would be provided by the Central Government. The Committee urge that all formalities necessary for the establishment of National Despatch Centre should be cleared and suitable steps taken to initiate work on this Centre expeditiously.

Reply of Government

The project report for phase I of the National Load Despatch Centre is being processed for according administrative approval. A provision of Rs. 23.56 lakhs has been made for the NLDC in the Annual Plan of 1978-79. Efforts are being made to acquire a plot of 2½ acres from DDA in Hauz Khas adjoining the plot allotted by DDA for RLDC of Northern Region.

[Ministry of Energy (Deptt. of Power) OM No. 40(9)|78-Coord. dated 18th Nov., 1978].

Recommendation Sl. No. 52 (Para Nos. 4.28 to 4.30)

The Committee had in para 5.56 of their 39th Report (1972-73) recommended that long range planning for the inter-State|Regional Grids should be devised keeping in view the fact that not only the State System should completely be integrated to form regional grids, but also these grids get adequately inter-connected to form a National Grid, with attendant economic gains to the community at large.

The Committee note that in setting up the Regional Grids, the only tengible progress that has been made so far relates to the first phase of the Southern Region. Government expect that the 2nd phase of the Southern Region would be completed in about two years from now. In the case of other three regions, namely, Northern, Western and Eastern Regions the Committee observed that Government is yet to acquire land in Northern and Western Regions. The Committee have also been informed that the preparation of specifications of the equipment would take one year and the supply of equipment would take another two years. According to the Government, the four regional grids would come into operation within four years from now.

The Committee are distressed to note that in an important matter such as establishment of regional grids, Government should have allowed such a long time to elapse and even then the preliminaries for setting up such grids have not been cleared so far. The Committee trust that Government would expedite matters and set up the Regional Grids within the shortest possible time and take necessary steps to inter-connect these grids to form a National Grid ultimately, so that the periodic power famine in certain regions could be overcome.

Reply of Government

The requirements for setting up the Regional grids are construction of Inter-State transmission lines and setting up of Load Despatch Centres at the regional and state level.

With a view to fostering the accelerated developemnt of inter-State|Regional lines, it was decided to treat these projects as Centrally Sponsored Projects from the beginning of the fourth plan and give 100 per cent loan assistance to the States outside the State Plan ceiling. Up to March 1978 loans totalling Rs. 73.63 crores have been released to various States. Under this programme, so far 22 projects involving 2068 circuit km of 220 kv lines and 710 circuit km

of 132|66 kv lines have been constructed and 19 projects involving 1347 circuit km of 220 kv lines and 816 circuit km of 132|66 kv lines are under various stages of construction.

As regards the setting up of the Load Despatch Centres at regional level, these are already operating on an interim basis in all the regions except the Southern Region, where a permanent Despatch Centre equipped with System Diagram Board, Telecommunication and Telemetering facilities has been set up. These despatch centres are coordinating the overhaul and maintenance schedules, collecting system operational data, preparing daily generation schedules, monitoring tie-line flows, arranging assistance between constituents, carrying out load-generation balance studies, etc. etc. As regards, the setting up of the permanent load despatch centres, the original sanctioned schemes for the Northern, Western, and Eastern Regions provided for a microwave communication system to be owned and to be operated by REBs. The P&T Department did not agree to sanctioning the microwave system for REBs and this led to the revision of the entire Project Report. The Change of building site for RLDC in the Northern Region from Badarpur to Hauz Khas and the acquisition of land for the RLDC buildings in Western and Eastern Regions also contributed to the delays.

The Project Reports for RLDCs in Northern, Western and Eastern Regions have since been revised.

Global tenders for load despatch equipment under IDA Transmission Credit were opened on 13th February, 1978. The tenders are being analysed. The detailed purchase orders for the equipment are likely to be placed by the end of October 1978 and the delivery of the equipment is likely to be completed by October, 1980. The installation, testing and commissioning of the various items of equipment in the Northern and Western Regions will take another one year and thus the RLDCs are expected to be operational by the end of 1981.

In the case of Eastern Region, while the same procedure is being followed, the scope of the RLDC project involves certain works to be carried out in the State Power Systems (i.e. between the Power Stations/sub-stations and State Load Despatch Centres). Further, the construction of building for RLDC which has been entrusted to CPWD will take about 9 months more compared to the time taken by them for the construction of similar buildings in Northern and Western Regions, because pile-foundations have to be provided considering the soil conditions. Thus the RLDC in the Eastern Region is expected to be operational by the end of 1982.

The implementation of Phase I of the RLDC in the Southern Region is complete. The despatch functions on a permanent basis have been started from the permanent RLDC building equipped with mosaic system diagram board, PLCC teleprinter and telemetring equipment. The LFC equipment covered under Phase II has been received and is being installed. It is expected that Phase II of the scheme will be commissioned by early 1979.

[Ministry of Energy (Deptt. of Power) OM No. 40(9)|78-Coord. dated 18th Nov., 1978].

Comments of the Committee

Please see para 1.28—Chapter I of the Report.

Recommendation Sl. No. 53 (Para Nos. 4.44 to 4.46)

The Committee in paragraph 5.45 of their 39th report (1972-73) noted that out of the 38 inter-State links taken up; 24 lines would be completed during the Fourth Plan period and the remaining lines within the next year or two. The Committee in paragraph 5.49 of their Report expressed their unhappiness at the lack of enthusiasm on the part of State authorities to pursue the inter-transmission programme vigorously even though the Centre had decided to provide 100 per cent loan assistance to States under Centrally sponsored schemes outside the State ceiling for construction of various inter-state links during the Fourth Plan period.

The Committee are informed that out of 24 lines targetted for completion during the Fourth plan period, only 8 lines were actually completed during that period, and 6 lines have been completed upto March, 1976, i.e., during the first two years of the Fifth Five Year Plan. Fourteen lines are expected to be completed upto 1978-79 and one line (viz. Dehri-Mughalsarai) is likely to be completed in the early Sixth Plan period. The committee cannot but view with great concern the tardy progress made in constructing these important inter-state lines, particularly when the centre had decided to provide 100 per cent loan assistance to States for the inter-transmission programme under centrally sponsored schemes outside the State ceiling.

The Committee would urge that Government should take up the question of early construction of inter-state links with the State authorities concerned and impress upon them the necessity of giving adequate priority for their speedy completion. On their own part, the Government should strictly monitor the progress of these

schemes and extend all necessary assistance that the States may require to ensure their speedy completion.

Reply of Government

Recognising the need for timely completion of inter-State transmission lines, the Government has been urging the States to take necessary steps. In areas where certain problems have been encountered, the Government has, with the cooperation of the concerned States, entrusted the construction of these lines to the National Hydro Electric Power Corporation. Further, with a view to facilitating timely flow of funds, the procedures for release of Central Loan Assistance have also been simplified. A construction monitoring directorate have been created in the Central Electricity Authority for continuous monitoring of various transmission schemes.

[Ministry of Energy (Deptt. of Power) O.M No. 40(9)|78-Coord. dated the 18th November, 1978]

Recommendation Sl. No. 54 (Para No. 4.47)

The Committee also find that one of the various objectives of the National Hydro Electric Power Corporation recently incorporated is to undertake wherever necessary the construction of inter-State transmission and ancillary works for timely and coordinated inter-State exchange of Power. The only line taken up by this Corporation is the Imphal line. The Committee trust that in order to speed up the projects Government would impress upon the State Governments|State Electricity Boards the need for entrusting construction of more inter-State lines to the National Hydro Electric Power Corporation, which is a Central Government Undertaking.

Reply of Government

The National Hydro Electric Corporation can undertake construction on Inter-State Transmission lines only with the consent of the concerned States. In specific projects where organisational problems are envisaged, the concerned State Governments would be advised for entrusting the work to NHEPC.

In addition to Imphal-Jiribam 132 KV line mentioned by the Estimates Committee, the construction of the following transmission lines has been entrusted to NHEPC:

(i) Ramnagar-Gandek	132 KV S|C
(ii) Gangtok-Kalimpong	66 KV S|C

[Ministry of Energy (Deptt. of Power) OM No. 40(9)|78-Coord. dated 18th Nov., 1978].

Recommendation Sl. No. 55 (Para No. 5.15 to 5.17)

The Committee in their 39th Report (1972-73) had pointed out the need to accelerate the pace of rural electrification in the country for a rapid all-round rural development and for bringing about far reaching changes in the methods of irrigation and farming. The Committee also took note of the fact that till 1972-73 hardly 23 per cent of the villages had been electrified and only 18,76,188 tube-wells energised. The Committee, therefore, recommended that a time-bound programme for rural electrification should be prepared which while fixing a long term programme for providing power to every village of the country should fix a target for providing electricity to each and every village having a specific number of residents.

The Committee note that out of a total number of about 5.76 lakh villages in the country, according to 1971 census, about 3.5 lakh villages have a population of less than 500. The progress made in rural electrification has been as follows:

	No. of villages electrified
At the beginning of the First Plan in 1951	3061
At the end of the First Plan	9047
At the end of the Second Plan	24891
At the end of the Third Plan	43932
At the end of 1968-69	73722
At the end of Fourth Plan	172169
As on 31-7-1976	188169
As on 31-3-1977	192635

While the Committee appreciate that the pace of electrification of villages has picked up momentum in recent years, they cannot help pointing out that much leeway is yet to be covered. In percentage terms, the number of villages electrified upto July, 1976 works out to about 33 per cent. The Committee would, therefore,

urge that Government should redouble their efforts in the direction of covering most of the villages within the shortest possible time.

Reply of Government

According to the latest available information 2,19,644 villages (38.1 per cent) were electrified upto 31-7-1978.

Steps are being taken to electrify more and more villages as expeditiously as possible within the availability of resources. The Draft Five Year Plan 1978—83 envisages electrification of one lakh additional villages. The Plan provides for an allocation of Rs. 1450 crores for Rural Electrification in the country. This is in addition to Rs. 300 crores, which is expected to be made available from Financial Institutions.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18 November, 1978]

Comments of the Committee

Please see para 1.33—Chapter I of the Report.

Recommendation Sl. No. 56 (Para No. 5.18)

The Committee have been informed that the progress of rural electrification was dependent on various factors viz. availabilities of power, transmission and distribution net work in rural areas, terrain, resources, organisational set up, availability of funds etc. and it was not therefore, considered practicable to prepare a time-bound programme fixing a target date for electrification of every village in the country. While the Committee realise the difficulties in fixing the target date of electrification for each village in the country, they would like to point out that the objective of total electrification of villages can be achieved only through realistic and perspective planning. The Committee also note in this connection, that Government have prepared a long term plan for the decade 1971—81 and this plan envisages electrification of 3.4 lakh villages by 1981. This programme would cover all villages with a population of 500 and above 50 per cent of villages with lower population. The Committee find that if this programme is fully implemented it would cover only about 61 per cent villages in the country by 1981. The Committee would, therefore, urge the Government to prepare a long term perspective plan, in close

consultation with the States, to cover all the villages for electrification so that work relating to allocation of resources, generation of power, construction of transmission and distribution lines etc. can be taken up well in advance and the objective realised.

Reply of Government

State Electricity Boards and Heads of Departments concerned with electricity in the States/Union Territories were advised to draw up perspective Plans for total village electrification.

Out of the 22 States and the 9 Union Territories, the States of Haryana and Punjab and the Union Territories of Chandigarh, Delhi and Pondicherry have already achieved 100 per cent village electrification. Perspective Plan proposals have been received from 18 States and 2 Union Territories. The States of Jammu & Kashmir (62.5 per cent) and Sikkim (22.3 per cent) and the Union Territories of Andaman & Nicobar Islands (17.7 per cent), Arunachal Pradesh (3.7 per cent), Lakshadweep (90.0 per cent) and Nizoram (4.4 per cent) are yet to send in their Perspective Plan proposals.

The States of Kerala and Tamil Nadu, with 96.5 per cent and 98.7 per cent village electrification respectively and the Union Territory of Dadra & Nagar Haveli with 68.1 per cent village electrification, expect to electrify all their villages before long.

The position in regard to the other States is as shown below:—

Sl. No.	Name of the State/Union Territory	Position as on 31-7-78	Funds required Rs. crores (as intmiated at the time of formulating the Plan)	Expected date of achieving 100% village electrification
1		2	3	4
By the end of the Sixth Plan (1983-84) :				
1	Karnataka	56·9%	96·55	1983-84
2.	Maharashtra	60·8%	114·09	1983-84
3.	Orissa	30·2%	262·98	1983-84
4.	Goa, Daman & Diu (U.T.) . . .	84·6%	0·31	1983-84

1	2	3	4	5
	By the end of the Seventh Plan (1988-89)			
5.	Uttar Pradesh	31·3%	641·80	1984-85
6.	Andhra Pradesh . . .	54·2%	238·57	1985-86
7.	Assam	10·1%	118·89	1986-87
8.	Himachal Pradesh	46·5%	46·90	1987-88
9.	Nagaland	26·0%	12·94	1988-89
10.	West Bengal	40·0%	102·62	1988-89
11.	Rajasthan	30·2%	366·78	1988-89
	By the end of the Eighth Plan (1993-94) :			
12.	Gujarat	45·9%	92·95	1990-91
13.	Meghalya	9·3%	27·72	1993-94
14.	Tripura . . .	9·8%	33·20	1993-94
	Beyond the end of the Eighth Plan :			
15.	Bihar	27·8%	497·00	1994-95
16.	Madhya Pradesh	24·0%	656·70	1994-95
17.	Manipur	12·1%	12·76	1994-95

The above States/Union Territories will be able to electrify all their villages by the dates indicated, subject to funds being made available. It has been indicated by them that about Rs. 3.360 crores will be required for the purpose.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Co-ord., dated 18th November, 1978].

Recommendation Sl. No. 57 (Para Nos. 5.19 & 5.20)

There should be well coordinated programme for energising pumpsets, establishment of rural industries and wide-spread growth of infra-structure such as transport, agro-based industries, forestry etc. The Committee note that as on 31 July, 1977, 31,09,194 pumpsets have been energised. Considering the need for attaining a rapid and sustained development of agriculture, it is imperative that greater and determined efforts are made to energise pumpsets in larger number.

The Committee note from the Budget speech of the Finance Minister in June, 1977 that under the programme of rural electrifi-

cation for energising pumpsets, a provision of Rs. 175 crores, which will also be augmented to a significant extent by institutional finance, has been made in the budget for 1977-78. The Committee hope that in the years to come, the programme of energising pumpsets will be given a high priority leading to a sustained and abiding green revolution.

Reply of Government

High priority is being given to energise the maximum number of pumpsets within the availability of the resources.

According to the report received so far, 33.67 lakh pumpsets have been energised in the country upto 31-7-1978.

The Draft Five Year Plan 1978—83 envisages energisation of additional 20 lakh pumpsets during the Plan period.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Co-ord., dated 18th November, 1978]

Recommendation Sl. No. 59 (Para Nos. 5.48 to 5.50) and Recommendation Sl. No. 60 (Para No. 5.51)

The Committee note that the national average for village electrification is 33.7 per cent. While some of the States such as Haryana, Tamil Nadu and Punjab and Kerala have attained 100 per cent coverage, in 12 States the level of village electrification is below the national average of 33.7 per cent. Among these 12 States, Sikkim, Meghalaya, Tripura, Assam and Manipur have percentages varying from 5.1 to 12, while Bihar, Orissa, Rajasthan, West Bengal and U.P. have percentages varying from 23.1 to 28.7. Madhya Pradesh has a percentage of 17.7 and Nagaland 20.2.

The Ministry of Energy have stated that the following are the main reasons for wide disparity in different States:

(i) Lack of awareness of benefits of electricity;

(ii) General economic backwardness;

(iii) Lack of desired level of investment in the rural electrification programme and consequent inadequacy of transmission and sub-transmission lines;

(iv) Constraints on the availability of ground water, physical resources, geographical conditions, including difficult and hilly terrains; and

(v) Sparce population and long distances between the villages.

The Committee are distressed that as many as 12 States should be below the national average in the matter of rural electrification. The Committee would urge that the Central Government should take up this matter with these State Governments at the highest level and stress the need for accelerating the pace of rural electrification and come forward with positive assistance to these States both in the matter of providing resources and in formulation of schemes for rural electrification, so that the wide gap in the percentage of rural electrification among the various States is narrowed down at the earliest.

The Committee understand that with a view to reducing the regional imbalance, the rural electrification programme has been taken up as part of the Minimum Needs Programme in the Fifth Plan. For this programme only such States which have not reached the coverage of 40 per cent population with electricity by the end of the Fourth Plan are eligible for allocation. In exceptional cases some provision has been made to enable the States to provide adequately for the tribal and backward pockets even when their coverage has reached the level of 30—40 per cent. Broad details of the areas to be covered under this programme have been worked out by the Planning Commission under which priority has been accorded to areas and districts which are more backward. The terms and viability criteria evolved for loans for schemes of such areas have been liberalised. The Committee have also been informed that the Rural Electrification Corporation has been giving special consideration and high priority for projects for electrification in under-developed and backward areas. The Committee would urge that Central Government and the REC should extend liberal assistance to the backward States so that the pace of rural electrification is accelerated and they come up to the level of more advanced States.

Reply of Government

Even though the States, which are backward in the matter of rural electrification, have by and large continued to lag behind the All India average in this regard, these States also have made steady

and significant progress. The present level of electrification in these States is as follows:—

Sl. No.	Name of State	Present level of Village electrification as on 31-7-1978
1.	Assam	10·1%
2.	Bihar	27·8%
3.	Madhya Pradesh	24·0%
4.	Manipur	12·1%
5.	Meghalaya	9·3%
6.	Nagaland	26·0%
7.	Rajasthan	30·2%
8.	Orissa	30·3%
9.	Sikkim	22·3%
10.	Tripura	9·8%
11.	Uttar Pradesh	31·3%
12.	West Bengal	31·0%

With a view to reducing the regional imbalances, rural electrification was taken up as a part of the Minimum Needs Programme (MNP) in the Fifth Plan in order to supplement the resources of the States and to ensure that by the end of the Plan period, atleast 30—40 per cent of the rural population in each State was covered with this facility. Loan assistance under this programme is made available to the States on relaxed terms and conditions. By the end of Fourth year of the Fifth Five Year Plan all States, except Assam (27.4 per cent), Meghalaya (20.9 per cent), Sikkim (15.8 per cent), Tripura (26 per cent) and Union Territories of Arunachal Pradesh (11.6 per cent) and Mizoram (10.8 per cent) had achieved the target of 30—40 per cent of rural population being covered by electricity.

The programme is also covered under the Revised Minimum Needs Programme (RMNP) in the Five Year—Plan 1978—83. The criteria for implementation of the programme has, however, been notified. While the MNP in the Fifth Plan envisaged 30—40 per cent of *rural population* in each State to be covered with electricity, the RMNP envisages electrification of atleast 50 per cent villages in all States during the next ten years 1978—88. 40,000 villages are proposed to be electrified under this programme during the Five Year period 1978—83. An amount of Rs. 250 crores has been provided in the Draft Five Year Plan 1978—83.

It is expected that with this exclusive allocation of funds the level of electrification in backward States will be improved considerably.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Co-ord., dated 18th November, 1978]

Comments of the Committee

Please see Para 1.41—Chapter I of the Report.

Recommendation Sl. No. 61 (Para No. 5.52)

The Committee note that a total of 1702 schemes involving loan assistance of Rs. 711.06 crores have been sanctioned so far (upto 2nd December, 1977) by the REC. Out of these 1702 schemes, 989 schemes accounting for a loan assistance of Rs. 456.24 crores are for the States which are lagging behind the All India average of village electrification. The Committee, however, note that out of Rs. 456.24 crores sanctioned for the schemes pertaining to the States lagging behind the national average of village electrification, only Rs. 254.64 crores have been drawn so far. Although the whole of the gap (between Rs. 456.24 crores and Rs. 254.64 crores) may not be taken as a shortfall, it was stated by the representative of the Ministry of Energy during evidence in December, 1976 that the slippage between the promised and the actual programme was there. The Committee are surprised that these States which lag behind in rural electrification have not come forward to fully utilise the loan assistance sanctioned by the REC. The Committee would like Government to take up this question with the concerned State Governments and urge them to utilise the loan sanctioned by the REC by speedily implementing the schemes.

Reply of Government

The Rural Electrification projects approved by the Corporation for loan assistance are normally phased for completion over a period ranging up to Five Years. The loan assistance sanctioned by the Corporation is not released to the Boards in one instalment after it is sanctioned. It is disbursed in instalments depending upon the progress in the implementation of the schemes.

While the first instalment is released on execution of loan documents and compliance of other formalities, the second and subsequent instalments are released according to the phases of the project on the prescribed level of physical progress being achieved.

Thus, there is always a gap between the amount of loan sanctioned and the amount disbursed at any point of time.

In many cases, the State Electricity Boards are not in a position to draw the loan instalments according to the phasing envisaged in the Project Report on account of the slow progress in their

execution. In such cases, the Corporation takes up with the State Electricity Boards and the State Governments impressing upon them the need for timely drawal of funds and completion of works according to the phasing of the projects. Wherever considered necessary, the Corporation also suggests suitable measures to improve the performance of the Projects.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Co-ord., dated 18th November, 1978]

Recommendation Sl. No. 62, (Para No. 5.53)

The Committee note that 713 schemes, involving loan assistance of Rs. 254.82 crores have also been sanctioned by the REC for States which are above the national average. The Committee would like that Central assistance for rural electrification may be mainly concentrated in the States which are lagging behind so as to enable them to come upto the level of the more advanced States at the earliest.

Reply of Government

Upto October, 1978 the Corporation had sanctioned 2,086 rural electrifictaion projects for a loan assistance of Rs. 853.09 crores. The break-up for the States which are above the national average level in the point of village electrification and below is as follows:—

	States above the national level	States at & below the national average	Total
Number of schemes sanctioned . . .	918	1,168	2,086
Loan amount approved	Rs. crores 325·79	Rs. crores 527·30	Rs. Crores 853·09
New villages to be electrified on completion of the schemes	32,288	85,368	1,17,656

It would be observed that the major thrust of the financial assistance sanctioned by the REC is in respect of States, which are below the national level of village electrification.

Even in the States which are above the national level of rural electrification, the financial assistance provided by the Corporation is by and large for schemes which are for extension of electricity to backward regions in these States.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Co-ord., dated 18th November, 1978]

Recommendation Sl. No. 63 (Para No. 5.54) and

Recommendation Sl. Nos. 64 (Para No. 5.55)

The Committee note that the REC had been suggesting to the States Electricity Boards to set up separate organisations dealing with rural electrification programme right from the point of formulation of schemes and upto the point of their implementation. They have, therefore, suggesected to the State Electricity Boards that there should be at the district level, Committees consisting of officials and non-officials concerned with the development of that particular area to formulate the schemes and then to monitor the schemes from time to time. Further that there should be coordination committees to monitor the progress of different schemes. A recommendation for more efficient coordination at State and district level with other related Departments was also made by the Committee of Members of Parliament on Rural Electrification (1971).

The Committee feel that inadequacy of funds alone has not been a major factor for the slow progress in rural electrification in the States which are below the national average. The Committee are of the view that, as indicated by the REC these States do not have the necessary organisational structure for formulation of schemes and monitoring their progress, and for ensuring their speedy compeletion. The Committee would like the Central Government to give concrete assistance to these States in formulating their schemes and formulate necessary guidelines in this regard. It may also be impressed upon the State Governments that they strengthen their organisational structure so that the pace of rural electrification is accelerated in their areas.

Reply of Government

The Rural Electrification Corporation has from time to time brought to the notice of the various State Electricity Boards the need to strengthen their organisation for a more effective implementation of Rural Electrification Schemes. Several State Electricity Boards have taken positive steps to re-organise their set up, for the formulation monitoring and speedy implementation of the schemes in their States. The position regarding the organisational set up in the following State Electricity Boards is given below:—

Assam	One Superintending Engineer with corresponding staff, is looking after the formulation and monitoring of Rural Electrification Schemes.
Andhra Pradesh . . .	One Chief Engineer assisted by Executive Engineers and other staff are functioning.

Bihar	Five Regional Boards have been created with full powers and authority to handle R.E. works. Visits the Engineer-in-Chief (RE) at Headquarters.
Gujarat	Additional Chief Engineer (RE) is assisted by Superintending Engineer and other staff for the formulation, monitoring and implementation of R.E. Schemes.
Karnataka	One S.E. (RE) assisted by two Executive Engineers and other staff are in charge of the formulation and monitoring of R.E. Schemes.
Jammu and Kashmir	Two separate Zonal Chief Engineers are responsible for formulation, control and co-ordination of R.E. schemes in the State.
Madhya Pradesh	One Deputy Chief Engineer (RE) assisted by two S.E. and connected staff are functioning for the formulation, monitoring and implementation of R.E. Schemes.
Maharashtra	One separate SE (RE) assisted by Executive Engineer and staff are in charge of the formulation and monitoring of RE Schemes. Four Zonal Chief Engineers have been made responsible for speedy execution of R.E. Schemes.
Orissa	Chief Engineer (RE) assisted by one SE(RE) assisted by necessary staff are in charge of the formulation and monitoring of RE Schemes.
Punjab	Two separate S.E., (RE), with the supporting staff are functioning; one SE (RE) is in charge of the planning and monitoring and the other S.E. is in charge of the construction.
Rajasthan	One Chief Engineer, assisted by one SE and other supporting staff are stationed at the headquarters for the formulation and monitoring of R.E. Schemes.
Tamil Nadu	One separate S.E. assisted by one Executive Engineer is looking after the works connected with R.E. Schemes.
Uttar Pradesh	The Chief Engineer (RE) is assisted by two SE (RE) to look after the formulation and monitoring of R.E. Schemes. Further steps are being taken to set up construction division for the implementation of RE Schemes.
West Bengal	One Additional Chief Engineer (RE) with two Deputy Chief Engineers (RE) and other supporting staff located at the headquarters is responsible for the formulation and monitoring of R.E Schemes. For construction circles have also been created for implementation of the projects.

The Corporation has initiated several measures for the integration of the Rural Electrification projects financed by it with the other development programmes as also for effective co-ordination of the activities of the State Electricity Boards and those of the agriculture minor irrigation and industries departments etc. All the State

Electricity Boards and the State Governments were advised for setting up of co-ordination committees at the State and district levels which could help in the formulation of schemes of rural electrification with reference to the potential demand for power, in the fields of agriculture and small industries and also could review the progress of implementation of these schemes at fixed intervals.

The Ministry has also advised all the State Governments to set up State level and District level Coordination Committees where they had not been set up and to activiate them where such Committees already existed. As a result of this, State and District level Committees have been formed in almost all the States and the progress of rural electrification programmes is reviewed.

The Corporation has taken steps to ensure closer contact with the field units, through frequent monitoring of schemes and greater investment in the initial phasing and formulation of projects in the States. It has opened Regional Offices which provide necessary assisstance to the State Electricity Boards in identification of areas for electrification, formulation of viable schemes and in keeping the Boards informed of the problems faced in the field in the implementation of the sanctioned schemes. These offices also render assistance for coordination among the various departmental agencies| departments in the area at the stage of formulation as well as implementation of rural electrification projects. The Regional Offices maintain a close liaison with the Boards on the one hand and the developmental and financing agencies on the other.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord., dated 18th November, 1978]

Recommendation Sl. No. 65, (Para Nos. 5.64 and 5.65)

The Committee note that as against a provision of Rs. 1098 crores proposed in the draft Fifth Plan for rural electrification, only a sum of Rs. 685 crores has been provided for rural electrification in the final Fifth Plan document. In addition, an unstated quantum of institutionalised advance would be available. The Committee have also been informed that Planning Commission had given an assurance to the effect that if the institutionalised advance would not be forthcoming, the plan allocation of Rs. 685 crores would be supplemented.

The Committee trust that with the increasing realisation of the vital role of rural electrification in the rural economy and the development of rural areas, lack of resources would not be allowed to act as a constraint in the progress of rural electrification and on the

contrary liberal allocation would be made to step up the pace of rural electrification in the country.

Reply of Government

The Draft Five Year Plan 1978—83 provides for an allocation of Rs. 1,450 crores for rural electrification in the country in addition to Rs. 300 crores, which is expected to be made available from Financial Institutions. It envisages electrification of one lakh additional villages over the Plan period. It is thus expected that about 55 per cent of the villages in the country will be having the benefit of electricity by March, 1983.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord., dated 18th November, 1978]

Recommendation Sl. No. 66 (Paras Nos. 5.75 to 5.79)

The Committee had in their 39th Report recommended that the provision of public lighting to the economically weaker sections of the society particularly in the Harijan and Adivasi areas and 'bastis' should be given special consideration by the Government and, if necessary, further incentives *viz.*, interest free loans etc. should be given to the State authorities concerned for this purpose. The Committee note that provision of Rs. 5 crores during the Fourth Plan had been made for giving loan assistance against specific schemes for provision of street lighting in Harijan 'bastis' adjacent to electrified villages with street lights. The Committee also note that as part of the programme of the Silver Jubilee year of the country's Independence, instructions were issued to State Governments|State Elecricity Boards to electrify one Harijan 'Basti' per day in every State of the country during the Silver Jubilee Year *i.e.*, from 15-8-1972 to 14-8-1973.

The Committee note that according to the scheme introduced by Government of India in December, 1971, for providing electricity to Harijan 'Bastis' in electrified villages loan assistance was being made available on concessional terms through the agency of REC to State Electricity Boards. Since then, the Rural Electrification Corporation has sanctioned 109 schemes of the various State Electricity Boards for a total amount of Rs. 4.5 crores envisaging extension of electricity to 10,460 Harijan Bastis adjoining the already electrified villages. So far 8,673 Harijan Bastis have been electrified under this programme and 787 Harijan Bastis are yet to be electrified.

The Committee also note that it is estimated that there are still about 8,500 villages where street light has been provided in the main villages, but it has not been extended to the adjoining Harijan Bastis and that after all the schemes sanctioned by the Rural Electrification Corporation for extension of electricity to the Harijan Bastis adjoining electrified villages have been fully implemented, about 4,500 more Harijan Bastis would still remain to be provided with street light facility.

The Committee have been informed that the power supply could be extended to these remaining 4,500 Harijan 'bastis' from the States' Annual Plan provisions made for Normal Development Works and|or Normal Rural Electrification Programme, and that the State Electricity Boards have been informed to take necessary action accordingly.

The Committee would have liked if the remaining 4,500 Harijan 'bastis' had also been covered by REC under the programme of extending loan assistance to States on concessional terms. The Committee hope that Central Government would urge the States to provide enough funds in their Annual Plans so that all the Harijan Bastis are electrified within a short period.

Reply of Government

The position was reviewed in pursuance of the Government's policy to extend electricity to the backward areas and especially to weaker sections of the society at the earliest. The Rural Electrification Corporation has been requested to find the necessary resources to extend electricity to the remaining Harijan 'Bastis' adjoining the already electrified villages from out of the funds made available to it for normal programmes and to call for schemes from State Electricity Boards for extension of electricity to Harijan Bastis adjoining electrified villages which had been left out.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated the 18th November, 1978]

Comments of the Committee

The Committee would like the Government to vigorously pursue implementation of their recommendation with the State Electricity Boards so as to ensure that all the Harijan Bastis referred to above are electrified within a short period.

Recommendation Sl. No. 69 (Paras 5.103 and 5.104)

While the Committee appreciate that certain quantum of loss of power is inherent in the transmission and distribution and the

cost of extending power for agricultural pump-sets is comparatively high, they are unable to agree with the view that purely on consideration of commercial viability of the Boards, the cost arising out of these factors should be passed on to the economically none to strong agricultural consumers. The Committee had already suggested earlier a re-appraisal of the electricity tariff. Such a review should also take into account, in the context of the need for giving impetus to agricultural growth, the extent to which, if at all, the cost of transmission|distribution as also transmission losses should be passed on to the agricultural consumers.

The Committee would also like to point out in this connection that while agriculturists need assured supply of power so that agricultural operations can go on unhampered the picture that obtain today is different. The agriculturists depending on pump-sets has to contend with frequent breakdowns of power supply and damage to motors due to violent fluctuations in voltage etc. The Committee, therefore, feel that merely energising of pump-sets without guaranteed supply of electricity will not inspire the agriculturists to go in for more pump-sets. The Committee hope that this matter would also receive an urgent consideration from the Central and State Governments and the power supply would be so managed that the agriculturists are assured of their minimum needs of power.

Reply of Government

The losses incidental to supply of power to agricultural consumers are quite high compared to the other types of consumers mainly because of the long lines to be extended and low utilization. There are continuous iron losses in the transformers installed for the purpose of agricultural supply whether energy is consumed or not. Novertheless, it is usual for the State Electricity Boards to evolve a tariff which is lower than the cost of supply for agricultural consumers keeping in view the national policy in respect of rural development and increasing food production. As the tariffs are formulated taking into account the system losses also, the entire burden of the loss inherent in power supply to agricultural Consumers are not fully passed on to them when the tariff for agricultural consumption is kept low.

It has been noted that the frequent interruptions of power supply, particularly unscheduled ones, besides causing inconvenience to the farmers, would also affect production adversely. Again, violent fluctuations in voltages and sustained poor voltage conditions often result in the burning of motors causing financial loss to the farmers.

In this connection, it may be stated that the Indian Electricity Rules stipulate the voltage limit for low and medium voltage supply and the State Electricity Boards are required to comply with the provisions of these Rules and, accordingly, supply power to the agriculturists within the voltage limits specified under such Rules. The attention of the State Governments|State Electricity Boards has again been drawn to the provisions of the Indian Electricity Rules and it has been emphasized that they take concerted steps to maintain proper voltage conditions and minimise interruptions in the matter of power supply to the agriculturists. The State Governments have also been advised to pass on suitable instructions to the Electrical Inspectors for the strict compliance of the Indian Electricity Rules, 1956.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord., dated 18th November, 1978]

Recommendation Sl. No. 70 (Paras Nos. 6.20 to 6.23)

The Estimates Committee had in their 30th Report expressed the view that an assessment of the indigenous machine building and design capacities and the time required for fabrication and delivery should be made with a view to planning imports, wherever indigenous capacity was not sufficient to meet the requirements of power development programme. The Committee were informed that Government had appointed a Committee of Ministers with a view to assessing the capability of indigenous manufactures of plant and equipment to meet the requirements of power development programme envisaged in the Fifth Plan. The additional capacity for the Fifth Plan 1974-75 to 1978-79 then envisaged was 21.2 MKW.

The Committee observe that to meet the envisaged addional capacity of 21.2 MKW, the Committee of Ministers on Indigenous Plant and Equipment made a number of recommendations, which *inter alia* included import of equipment of various sizes, *viz.*, 200 MW unit sizes and 500 MW unit sizes. The Committee were informed during evidence that consequent on scaling down of the targets of additional capacity during the Fifth Plan period (1974-75 to 1978-79), from 21.2 MKW to 12.5 MKW, the indigenous manufacturers of plant and equipment were capable of meeting the requirements of the Fifth Plan (*viz.*, 1973-74 to 1978-79) and there would be no necessity of importing any generating plant or equipment during this period.

The Committee also note that the capacity available with BHEL and others in private sector would take care of the total re-

quirements of power transformers in the country during the Fifth Plan (1973-74 to 1978-79) period.

The Committee have been informed that with the present capacity, power plant equipment with total generating capacity varying from 4000 MW to 5000 MW (depending upon the mix of various unit ratings) can be produced within the country. The Committee hope that the equipment manufactured within the country incorporates the latest technology for the most efficient and economical generation, transmission/distribution of power. The Committee would also like the Governments to ensure that the manufacturers supply the required equipment according to the stipulated schedules so that there are no delays in erecting and commissioning of the power plants which, apart from delayed supply of power, result in avoidable escalation of costs. The Committee have also referred to this aspect elsewhere in the Report.

Reply of Government

There have been instances of delay in delivery and non-sequential delivery of equipment by BHEL, IL Kota. Instances of delay in delivery of equipment for auxiliaries and components manufactured by sub-contractors to BHEL, and ILK have also been reported. As far as timely delivery of equipment is concerned, both the Ministry of Energy and the CEA are in constant touch with the major suppliers of equipment to ensure delivery of equipment to projects in a phased and coordinated manner so as to match with the requirements of the construction programme. As regards incorporation of latest technology, Messrs BHEL, who are the major suppliers of heavy equipment, have informed that they have been up-dating the technology for their equipment on a continuous basis as a part of their collaboration arrangements with foreign firms. For instance, they initially started the manufacture of boilers based on the technology of SKODA, Czeckoslovakia. In order to get the latest technology, BHEL has since changed over their collaboration to M/s. Combustion Engineering of USA. Similarly, in the case of turbines and generators, their original collaboration was with Russia for 100 MW and 200 MW sets, Czeckoslovakia for 110 MW sets and with U.K. for 120 MW sets. Recently they have entered into collaboration with M/s. K.W.U. of West Germany. Similarly in the case of hydro equipment, M/s. BHEL have entered into a collaboration arrangement with a Japanese firm to acquire the latest knowhow in respect of pump turbines.

M/s. Instrumentation Ltd., Kota, who are major suppliers of instrumentation and control for the power stations have recently entered into collaboration with M/s. George kent, U.K. for the manufacture of latest range of process control instrumentation for power stations. M/s. ILK have informed that the new range of instruments are compact, provide high density power and also computer compatability which is required in all modern power stations. M/s. KELTRON, a Government of Kerala undertaking has also been licensed to manufacture control and instrumentation for power stations in collaboration with M/s. Bailly Merbs of France. M/s. Taylors have also been given licence for the manufacture of control and instrumentation for power stations in collaboration with M/s. Taylors, USA.

[M/O Energy, Deptt. of Power, O.M. No. 40(9)/78-Coord. 18 Nov., 1978]

Recommendation Sl. No. 71 (Para No. 6.24)

In order to review the performance of indigenous Power Plants, a Standing Committee has been constituted, consisting of the representatives of Central Electricity Authority, Bharat Heavy Electricals Ltd., Instrumentation Ltd., Kota, and others. This Committee has been reviewing continuously the performance of indigenous power plant and equipment commissioned in the recent past. It had studied in depth, units commissioned upto December, 1974. As a result problem areas have been identified and plans of action drawn up, identifying the role of BHEL, Instrumentation Ltd., Kota, and the CEA to improve the units. The Committee learn that as a result of such review and the efforts of the Standing Committee, the performance of certain Power stations has shown considerable improvement. The Committee would urge that this Standing Committee should cover all the power Stations within a time bound programme so that the optimum performance of all the existing power plants is ensured and break-downs in power supply are eliminated.

Reply of Government

The recommendations of the Estimates Committee have been noted.

[M/O Energy, Deptt. of Power, O.M. No. 40(9)/78-Coord. 18 Nov., 1978].

Recommendation Sl. No. 72 (Para Nos. 6.49 to 6.52)

The Committee in their earlier Report had recommended that keeping in view the requirement of coal for large power stations, the methods of mining, loading and unloading as well as

trnasport would have to be revolutionised introducing the latest techniques for efficiency and economy. The Committee were informed that for studying the rail transport facilities required for movement of coal during the Fifth Plan (1974-75 to 1978-79), the Ministry of Railways appointed three teams and the task allotted to each of them was as follows:—

(i) To prepare a short term plan for rationalisation of coal loading arrangements in Bengal-Bihar coal fields;

(ii) To assess the Fifth Plan requirements of rail transport of coal and the facilities required in Bengal-Bihar coal fields;

(iii) To assess the Fifth Plan requirements and facilities for rail transport of coal in the outlaying coal fields.

The Committee note that the following important measures have been initiated as a result of the recommendations of the study teams:—

(a) The number of loading points in the Raniganj and Mugma coal fields is being reduced from 379 to 121 and the work is in progress.

(b) Mechanisation of loading arrangements is to be confined to collieries producing over 25,000 tonnes per month, and is being planned in nearly 1000 collieries.

(c) The number of spilts in a rake is to be reduced from average of seven to an average of five in the Raniganj coalfields.

(d) Weighbridges of 60 tonnes is to be replaced by 100 tonnes at major coal loading points where loading was more than 10 rakes a month.

The Committee have also been informed that in the allotment of wagons for haulage of coal to thermal stations at present there are no bottlenecks and that the supply position is 'extremely satisfactory'.

The Committee, however, find that in the matter of supply of coal of a particular type to a particular thermal power station, there is still scope for improvement and that an exercise is going on bilaterally between Coal India and the various Power Stations for evolving final agreement, preferably on a long term basis, so that there can be a commercial binding on the delivery dates and a certain quality is ensured. The Committee also note that the coal

Linkage Committee reviews the linkages of coal to various Power Stations every three months wherein the quantities and qualities of coal are discussed and finalised. In addition the Central Electricity Authority and the Department of Power also take up the matter wherever there are persistent reports of poor quality of coal being supplied to the power stations. The Committee need hardly emphasise that for efficient and economical generation of power in the coal based thermal stations and to avoid shut-downs, it is necessary that the requisite quality of coal is supplied. Now that there are no bottlenecks in adequate supply of coal to the power stations. the Committee trust that the Coal Linkage Committee would give greater attention to this aspect while reviewing the linkages of collieries to the power stations and ensure that no complaints in regard to the quality of coal arise. The Committee also hope that the exercise undertaken for entering into formal agreement for a commercial binding in regard to delivery dates and for ensuring supply of coal of a certain quality would be completed expeditiously so that there are no difficulties in regard to the timely supply of coal in adequate quantity and of requisite quality.

Reply of Government

The Committee was informed earlier that there were no bottlenecks in the allotment of wagons for haulage of coal to thermal stations at that time but difficulties are now again being experienced for the last six months or so in matters of wagon availability for transport of coal to power stations. It is understood that there is shortage of wheels to overcome which necessary action is being taken by the Ministry of Railways. Recent floods in the Eastern Region also affected the supply of coal to power stations linked with coal fields in the Eastern Region. The power station authorities have been advised to keep a stock of 30 days consumption in the case of power stations beyond 350 kms. for main source of coal supply, 20 days stock for power stations within 350 kms. and 10 days stock for pithead power stations. Coal supplying agencies and Railways have also been requested to help power stations build up coal stocks on the above mentioned levels. It is hoped that the position of supply of coal to the power stations would improve in the next few months.

The Government of India is fully aware of the need for supply of proper quality of coal for thermal power stations in the country. For efficient operation of these stations, it is very necessary that they get coal of a quality for which the boilers are designed. To meet this requirement, each station is linked to the coalfield by the Coal

Linkage Committee, which has representatives from the Department of Coal, Railways and the Central Electricity Authority. Within this linkage, coal companies and the power stations draw up the detailed linkage from colliery/collieries. Inspite of this, there have been complaints from the power station authorities regarding supply of poor quality of coal arising mainly on account of presence of extraneous material like sand, shale, slate, stones etc. and excessive quantity of lumps and fines. As a further step to improve the quality of coal to the various consumers, the Department of Coal had recently set up a Committee which has since submitted its report. In accordance with the recommendation of this Committee, the Department of Coal have issued instructions to the various mining agencies to take the following remedial measures:

(i) to ensure coal being loaded in wagons for transport to the power stations to confirm strictly to the specifications both in respect of size and quality;

(ii) Joint sampling of coal both at the loading as well as at the power station end. In the case of pithead station joint sampling to be taken up at the loading end.

(iii) to install crushers and sieves at the collieries to limit the size of coal as required by the power stations;

(iv) efficient hand-picking of shale, slate and stone;

(v) to improve methods of mining so that extraneous material from over-burden and sand from sand stowing does not get mixed up with coal; and

(vi) a regular analysis of coal to be carried out at least in respect of big mines which are supplying large quantities of coal to power stations.

A constant watch is being kept on the quality of coal supplied to thermal stations and it is expected that the position would improve with the full implementation of the above measures.

Another step which the Department of Power has taken to ensure proper quality of coal to the power stations is that they have circulated guidelines to all the State Electricity Boards for entering into formal contract with the coal supply authorities so that there is a commercial binding to ensure supply of both quantity and quality of coal required for the power stations. Some of the State Electricity Boards have, however, raised a number of queries particularly

about bonus/penalty clauses, joint inspections, advance payments etc. and the matter is being followed with them and the coal suppliers. Tamil Nadu Electricity Board has recently concluded an agreement with Coal India for the supply of coal to the power stations in Tamil Nadu.

For improving the quality of coal to power/stations benefication of coal has to be considered. A begining in this direction has been made in Singrauli coal field where a benefication plant for washing Jhingurda coal has been agreed by UPSEB and Coal Companies have drawn up details for the same.

[Ministry of Energy (Department of Power) O.M. No. 40(9)|78-Coord. dated the 18th November, 1978]

Recommendations Sl. No. 74 (Para No. 7.21 to 7.28)

The Committee note that at present the total nuclear power installed capacity in operation in the country is 640 MW, which forms about 3 per cent of the country's generation of power.

The Committee observe from the Report of the Fuel Policy Committee (1974) that the Department of Atomic Energy's long-term strategy for development of nuclear energy envisages the following nuclear capacities:

	Installed Nuclear capacity
By 1978-79	1,020 MW(e)
By 1983-84	1,900 MW(e)
By 1990-91	8,620 MW(e)

The Fuel Policy Committee have observed that in the absence of reliable data to determine the optimal level of nuclear power generation capacity that is to be established between 1983-84 and 1990-91, it would be prudent to assume a constructive estimate 4000 MW, and recommended that the nuclear capacity should be increased in the years beyond 1983-84 based on a re-appraisal of the nuclear power programme.

The Committee further note that the Task Force set up by the Department of Atomic Energy have recommended the commissioning of a total capacity of 4,720 MW(e) based on natural uranium by March, 1989 and in case uranium availability permits take up another 3000 MW(e) at that time.

The Committee were informed in March, 1977 that the installed capacity would rise to 1095 MW(e) by the end of 1978-79 from 640 MW(e) at the end of the Fourth Plan and an additional capacity of 705 MW(e) would be added during the next 5 years to make it 1800 MW(e) at the end of 1983-84.

The Committee, however, find from the Performance Budget document of the Department of Atomic Energy for the year 1977-78 and from the reply of the Prime Minister to an Unstarred Question in the Lok Sabha on 20th July, 1977 that the nuclear power generating capacity expected to be achieved would be as under—

1978-79	800 MW(e)
1983-84	1,580 MW(e)
1990-91	6000 MW(e)

The Committee thus find that the target of capacity has now been reduced from 1095 MW(e) to 800 MW(e) at the end of the 1978-79, from 1800 MW(e) to 1680 MW(e) at the end of the 1983-84 and from 8620 MW(e) to 6000 MW(e) at the end of 1980-91. The contribution of nuclear power to the total power generation capacity will only be 2.5 per cent at the end of 1978-79 and 4 per cent by the end of the Sixth Plan (1983-84) and 7 per cent by 1990-91. The Committee thus observe that the pace of development of nuclear power in the country will be slower than was envisaged originally by the Department of Atomic Energy themselves and their Task Force and the Fuel Policy Committee.

The Committee need hardly emphasise that even if this modest capacity of 6000 MW(e) is to be achieved by 1990-91, a long term perspective plan has to be drawn up right now taking into account the various constraints in the availability of fuel, and the long gestation period of nuclear plants etc. The Committee trust that in the light of the recommendations of the Task Force and the Fuel Policy Committee, Government would evolve such a long-term plan for further building up of nuclear power capacities in the country.

Reply of Government

It is true that the contribution of nuclear power to the country's power programme fell short of the earlier targets during the 4th and 5th Five Year Plans. The main constraints experienced were:

(i) Incapability of the indigenous industry to absorb and develop new technologies for the manufacture of sophisticated and complex equipments;

(ii) Delay in the supply of equipment by the indigenous manufacturers due to disturbed labour position and transport dislocation;

(iii) Difficulties experienced in importing critical equipments and materials as a result of embargo placed by certain countries; and

(iv) Non-availability of Heavy Water in time.

The above major constraints are being overcome. The design of some of the equipment have been simplified and in some cases standardised. Advance procurement action is being taken for the procurement of raw materials. As a result of these developments, manufacturing delays are expected to be minimised.

The Working Group on Power Development reviewed the nuclear power development programme during the five year period 1978-83. Besides the completion of second reactor of 220 MW nuclear execution at Ranapratap Sagar, two units of 235 MW each at Kalpakkam in the Southern Region and one unit of 235 MW at Narora in the Northern Region are expected to be commissioned by 1982-83. This programme was incorporated in the Draft Five Year Plan 1978-83. The total installed capacity of nuclear plants in operation by 1982-83 was estimated at 1565 MW. The Department of Atomic Energy is also undertaking a review of the targets mentioned in the Report of the Task Force with a view to making a realistic assessment of the future nuclear power generation programme.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord., dated 18th November, 1978]

Recommendation 75, Para No. 7.42 & 7.43

The Committee note that according to the Task Force of the Department of Atomic Energy, one of the constraints for undertaking a larger programme for nuclear power development would be the availability of uranium. According to the Fuel Policy Committee Report, the present level of uranium production would meet

the requirements of the envisaged nuclear programme only upto the year 1984. If the nuclear power capacity is to be substantially increased during the period 1984 to 1990-91 as envisaged in the long-term strategy for nuclear power development, it would be necessary to discover uranium deposits on a large scale and increase the uranium production capacity. The Committee trust that concerted efforts would be made not only to step up the exploration work to locate additional deposits, but also to set up production units in a planned manner in the areas of M.P., and H.P., and Meghalaya where fresh deposits of uranium richer than those in Bihar have been located so that non-availability of uranium does not act as a constraint in augmenting the nuclear power capacity in the country.

The Committee note that thorium reserves in India are the largest in the world and are estimated at about 4,50,100 tonnes. The Committee further understand from the Report of the Fuel Policy Committee that fast breeder reactor would be able to produce fissile U 233 from Thorium. The Committee have been informed during evidence that the process of making U 233 from thorium has already been designed and a few kgs. of the material produced. The Committee hope that while formulating the long-term plan for the development of nuclear power the indigenous availability of the minerals like uranium and thorium would be taken into consideration, so that the country would not have to depend on other countries for the nuclear fuel for the reactors.

Reply of Government

Every effort is being made to enhance uranium ore reserves position for atomic power programme. Geologically favourable areas in parts of Northern and Eastern Himalayas, Madhya Pradesh and Uttar Pradesh are presently being explored. As a result of survey and prospecting operations carried out by the Department, certain potential areas in Madhya Pradesh, Himachal Pradesh and Meghalaya have been identified. It is proposed to undertake detailed exploratory mining in the above mentioned areas during the Five Year Plan period 1978-83.

The long term strategy for the development of nuclear power in the country is to make the best use of available quantities of uranium and the considerable thorium deposits in the country. A fast breeder test reactor is presently under construction at Kalpakkam which will enable us to achieve a break through in the technology for using thorium as a fuel for future generation of nuclear power reactors.

[Ministry of Energy (Department of Power) O.M. No. 40/9/78-Coord., dated 18th November, 1978]

Recommendation Sl. 77, (Para No. 7.47)

The Committee would also urge that the development of technology for enrichment of uranium within the country itself for which preliminary studies are stated to have already been initiated in the Bhaba Atomic Research Centre should be accelerated and no efforts spared to develop this technology within the shortest possible time so as to rid the country of dependence on foreign countries in this vital field.

Reply of Government

The presently established technology for uranium enrichment based on gaseous diffusion is highly capital intensive and energy consuming and is not well suited to small scale applications. Enrichment technology based on centrifugal process and laser excitation are better suited for smaller level of production. However, these technologies are not as well developed in India. Work on the development of these technologies is being done and experiments at laboratory level are showing encouraging results. Efforts in this direction are continuing.

[Ministry of Energy, Deptt. of Power O.M. No. 40(9)/78-Coord. dated the 18 Nov., 1978]

Recommendation Sl. 78, (Para No. 7.57 to 7.63)

The Committee note that the Department of Atomic Energy is setting up heavy water plants at Kotah, Baroda, Tuticorin and Talcher. In addition, the Department have also entered into a contract for the purchase of 200 tonnes of heavy water from the USSR. The Committee have been informed that the heavy water which would be available from these plants and the supply from USSR would meet the requirements of the Atomic Power Plants upto and including the two reactors of Narora.

The Committee note that the Heavy Water Plant at Kotah which was expected to be commissioned in 1974, has not so far been commissioned. According to the latest information (February, 1978) furnished to the Committee, the erection of the plant will be completed by November/December, 1978 subject to the receipt of booster by April, 1978, and the employees' strike being called off in the near future. It was earlier stated that the plant was expected to be commissioned by the end of 1978, but it has now been stated that the plant is expected to be commissioned in 7-8 months after the erection work is over, which is scheduled to be completed by November/December, 1978.

The Committee further note that the Heavy Water Plant at Baroda was scheduled to be commissioned in 1973. However, the Committee find that after completion of various maintenance jobs and balance modifications, commissioning of the Plant was restarted in November, 1976. The Committee have now been informed that the plant met with a mishap on the 3rd December, 1977. It is expected that in case it does not involve the replacement of any major high pressure equipment, valves or piping, the revamping work can be completed and the plant put back on production by April, 1979. A clear picture will, however emerge after receipt of the report of the Committee looking into the mishap and after obtaining results of the various tests being carried out.

With regard to the Tuticorin Plant, which was scheduled for commissioning during 1974-75, the Committee note from the information furnished to them in March, 1977, that the testing and commissioning of the Plant was expected to begin in April/May, 1977, and the plant commissioned by the end of 1977. The Committee have been informed in February, 1978 that the plant is undergoing commissioning trials and is expected to be on stream by the end of March, 1978.

As regards Talcher Plant, the Committee have been informed that the schedule for commissioning the plant has been adversely affected by the delays in the delivery of indigenous equipment and the Plant is likely to be commissioned in middle 1978. In a later note (February, 1978), the Committee have been informed that mechanical erection is expected to be completed by the end of July, 1978. It is, however, understood that the Synthesis gas from Fertilizer Corporation of India, Talcher will be available in April, 1979. The plant would be commissioned within 4-5 months from the date of availability of Synthesis gas from Fertilizer Corporation of India, Talcher.

The Committee had, as early as 1969-70, in their 129th Report on Atomic Power observed with regret that nothing substantial had been done in regard to the production of heavy water indigenously and they had drawn pointed attention of the Government to the urgent need to produce heavy water within the country to meet the requirements of the atomic power projects.

The Committee are distressed to note that in spite of government assurance given in 1971 that "all efforts are being made to complete the plants as quickly as possible", none of the four heavy water plants has been commissioned on schedule and in certain cases like the plants at Kotah and Baroda, considerable slippage has been allowed to occur. The Committee are surprised that Government should have allowed slippage in Commissioning schedules in a vital

field like heavy water production on which the entire nuclear power programme depends, leaving no option to the Government but to enter into an agreement with another country for the supply of heavy water. The Committee hope that Government would at least now ensure by closer and effective monitoring that no further delays occur and the plants are commissioned within the shortest possible time.

Reply of Government

The slippage in the time schedule for completion of the various Heavy Water Plants was in circumstances which were beyond our control. The present status of each of the plant is indicated below:

1. Heavy Water Project, Kotah

The mechanical completion of the plant was originally scheduled in July 1975. The project schedule was upset mainly due to considerable delays on the part of indigenous fabricators and suppliers in maintaining the delivery schedules because of stringent specifications; delays on the part of foreign suppliers, poor response to tenders for major civil contracts, modifications in the engineering as a result of detailing of operation and maintenance manuals, disturbed labour conditions etc. It is now expected that mechanical completion would be over by May, 1979, and the plant would start production by March 1980, if there is no hitch in the supply of steam and power from Rajasthan Atomic Power Station.

2. Heavy Water Project, Baroda

The plant was commissioned in November, 1977 but was shut down on 3rd December 1977 due to an accident caused by the failure of a high pressure component resulting in fire and explosion. Assessment of the damage and testing has been practically completed and action for replacement of the damaged components/materials has been initiated. The plant is expected to be recommissioned by October, 1979.

3. Heavy Water Project, Tuticorin

The completion of erection and testing was delayed mainly due to delays on the part of indigenous fabricators in maintaining delivery schedules, several modifications carried out by Gelpra on the piping systems, 'term' valves and in the final enrichment section and the need to enforce stringent chemical cleaning specifications and leak tightness procedures.

Mechanical erection of the plant was completed in September, 1977. Commissioning of the plant is in progress. There have been a large number of interruptions due to outages of the Ammonia Plant at SPIC and power trips. The Plant has been restarted in July, 1978 and trial production has begun.

4. Heavy Water Project, Talcher

The progress of the work was affected due to delays on the part of indigenous fabricators in not maintaining the delivery schedules and disturbed labour conditions at site, besides the loss of towers on the high seas. Most of the equipment has been received and its erection is nearing completion. Civil works are also substantially completed. Piping erection, insulation and instrumentation are in progress and mechanical erection and testing is expected to be completed by February, 1979. Subject to the availability of Synthesis gas from Fertilizer Corporation of India, the plant is likely to go on stream by July-August 1979.

All possible steps to ensure close and effective monitoring are being taken. However, heavy water plants, unlike other fertilizer and chemical plants, are sensitive to outages from Ammonia Plant, power trips etc., and any interruption on this account affects the equilibrium condition of the plant and consequently the start-up of production.

[Ministry of Energy, Deptt. of Power O.M. No. 40(9)/78-Coord. dated the 18 Nov., 1978]

Recommendation Sl. 79, (Para No. 7.64)

As regards the future programme for setting up additional heavy water plants the Committee have been informed that it would depend upon the decisions taken regarding the nuclear power programme. Considering the long time taken in commissioning heavy water plants, the Committee trust that adequate advance planning will be made for setting up such plants as a part of the long-term plan for development of nuclear power.

Reply of Government

It is proposed to undertake construction of a new heavy water plant during the Five Year Plan period 1978—83. Advance planning in respect of new plants, both in terms of cost and the gestation period, would be practicable only when complete data such as capacity and operating pressure of the ammonia plant with which the Heavy Water Plant is to be integrated, the location of the fertilizer

plants and the extent of foreign collaboration which may be required is firmed up.

[Ministry of Energy, Deptt. of Power O.M. No. 40(9)/78-Coord. dated the 18 Nov., 1978]

Recommendation Sl. 80, (Para No. 7.78)

The Committee are informed that the Tarapur Atomic Power Station is "working fairly well" at 57 per cent capacity which is stated to be quite good. They are distressed to find that the Rajasthan Atomic Power Project Unit I had to face a number of problems. Earlier sand was found in the turbo set which had to be stripped out and later the blading broke and had to be replaced. The Committee observe from the Annual Report of the Department of Atomic Energy for 1976-77 that the year 1976-77 has seen considerable improvement in the operation of the unit and it has attained a continuous outage-free operation during October and November, 1976. The Committee hope that this tampo would not only be maintained but further improved upon.

Reply of Government

The plant factor of 61.14 per cent achieved by Tarapur Atomic Power Station during 1977 is comparable with the Average Plant factor of similar power stations in U.S.A. and other countries—around 56.48 per cent.

As regards Rajasthan Atomic Power Station, Unit-I, which was shut down on 2nd July, 1977, continued to be shut down due to workers' strike which started on September 8, 1977 and ended on January 7, 1978. In addition to regular maintenance, a number of design improvements/modifications were planned to be carried out during the shut down. Majority of them are being completed and it is expected that the Unit-I will be restarted by mid-August, 1978. The delay is due to slow pick-up of work, periodic tool down strikes and continued agitational approach by workers since they resumed duty on January 7, 1978 after the strike and also unforeseen engineering problems. With the modification and maintenance jobs carried out, the unit is expected to operate with more than 60 per cent capacity factor.

[Ministry of Energy, Deptt. of Power O.M. No. 40(9)/78-Coord, dated the 18 Nov., 1978]

Recommendation Sl. 81, (Para Nos. 7.79 and 7.80)

The Committee note that the following power plants are under different stages of construction:—

(i) Rajasthan Atomic Power Project—Unit II.

(ii) Madras Atomic Power Project—Kalpakkam—Units I & II.

(iii) Narora.

The Committee observe that the benefits of the second unit at Rajasthan Atomic Power Project and first unit of Madras Atomic Power Project are included in the Fifth Plan The targets are December, 1981 and 1982 for Units I & II at Narora. The Committee would urge Government to take concerted measures to eliminate all delays by strict monitoring of the progress of construction of these projects, and ensure that they are commissioned according to the schedules now laid down.

Reply of Government

For Rajasthan Atomic Power Project—Unit-2, major construction has been completed and commissioning is in progress. The criticality of the reactor is expected during the year 1978-79 subject to availability of full quantity of heavy water about three months before criticality. Based on present assessment, it is expected that the two units each of Madras Atomic Power Project and Narora Atomic Power Project would be commissioned during the period 1979—81 and 1984-85 respectively. Efforts are being made to adhere to these schedules.

In order to eliminate delays by strict monitoring of the progress of construction of the projects, a Project Monitoring Cell has been set up in the Department of Atomic Energy. Consultancy assistance from M/s. Engineers India Limited who have wide indigenous experience in this field, has also been obtained for revamping the monitoring system. Other measures such as improving the efficacy of procurement and monitoring of vendor performance are also being taken. These efforts are helping in identifying areas where internal improvements of strengthening are necessary. As a part of this on-going effort the Department intends to analyse its planning process and project management practices. These supplemented by measures such as specialised training selective computerisation etc., are expected to assist in achieving the objectives stressed by the Committee.

[Ministry of Energy, Deptt. of Power O.M. No. 40(9)/78-Coord, dated the 18 Nov., 1978]

Recommendation Sl. No. 83 (Para No. 7.85)

The Committee have no doubt that with the large R&D facilities available with the Department of Atomic Energy, the necessary proto-type of all the items now being imported can be fabricated and the indigenous manufacturers such as BHEL, Instrumentation Ltd., Kotah and REC, Ranchi and other private sector manufacturers could be encouraged to produce these items. The Committee urge Government to take all necessary steps to ensure maximum indigenisation of the equipment and spares required so that the country does not remain dependent on foreign countries for these items.

Reply of Government

Special efforts to promote indigenization are being made for quite some time. During the last decade efforts were continuously made to get the equipment fabricated by Public Sector Undertakings like BHEL, Instrumentation Kota, BHPV, BPCL, Richardson and Cruddas etc., and private organisations like Larsen and Toubro, Walchandnagar Industries Ltd., Cooper Engineering, Kirloskar Bros. Ltd., Jyoti Ltd., etc. Special Cells have been set up in each project for import substitution. Efforts are also being made, wherever possible, to replace equipments like valves and pumps in a phased manner by indigenous substitutes. Development of spares for imported equipment has also been taken up to eliminate dependence on foreign countries.

There are, however, inherent restrictions in replacing proprietory components, as specifications or manufacturing details on these are generally not available nor can they be easily duplicated without endangering safety and reliability.

[Ministry of Energy, Deptt. of Power O.M. No. 40(9)/78-Coord, dated the 18 Nov., 1978]

Recommendation Sl. No. 84 (Para No. 8.12-8.13)

The Committee note that in order to step up research and development activities in the field of power, grants-in-aid are given to State Electricity Boards through Central Board of Irrigation and Power for conducting studies in generation, transmission and distribution problems etc. The Fifth Plan outlay for CBIP schemes works out to Rs. 128 lakhs. The Central Power Research Institute at Bangalore has also been provided with a Fifth Plan outlay of Rs. 426.8 lakhs. The Committee have been informed that CPRI

Bangalore and CBI&P have taken up research schemes in areas of great relevance in generation, transmission and distribution systems in the country.

8.13. The Committee need hardly stress that there should be close coordination among the various agencies that are engaged in research in power problems, so that overlapping and wasteful duplication of efforts is avoided.

Reply of Government

As per the provision of the Electricity (Supply) Amendment Act (1976), and the Rules framed thereunder, the Central Electricity Authority is required to provide the necessary coordination among the various agencies involved in R&D activities. In so far as CPRI and CBIP are concerned, the CEA is already closely associated with their R&D activities. Besides CPRI & CBIP, however, there are also a number of other agencies involved in R&D work in the Power Sector such as NCST, SERC, CSIR, Educational Institutions etc. There are also the industrial establishments such as BHEL and others engaged in the manufacture of equipment who mainly deal with problems of product development within their range of manufacture. In addition, the National Research Development Corporation arranges commercial exploitation of processes and products developed in the various laboratories run by the Government. In this connection, it may be mentioned that the Planning Commission has recently reconstituted a Working Group on Power to consider proposals on power development for the period i.e. 1979-80 to 1983-84. As a part of this, the Chairman, Central Electricity Authority has formed a Sub-Group to study in depth the organisational structure for R&D work and the manner in which coordination has to be provided among the various agencies engaged in R&D work, so as to ensure that there is no duplication of work.

[M/O Energy, Deptt. of Power, O.M. No. 40(9)/78-Coord. 18 Nov., 1978].

Comments of the Committee

The Committee may be informed of the findings of the Working Group on Power set up by the Planning Commission and the follow-up action taken thereon.

Recommendation Sl. No. 85 (Para No. 8.14)

The Committee would like that greater emphasis should be placed on problem oriented research and it is, therefore necessary that

priorities for research projects have to be laid down on the basis of needs and problems faced in the field. They desire that research in power-problems that lead to substantial reduction in losses in generation, transmission and distribution of power should be accorded higher priority.

Reply of Government

R&D activity in power sector is basically oriented towards either problems faced in the filed or development of new products to meet future needs. The research projects as sponsored by the CBI&P and as listed in Appendixes 19 and 20 of the Sixteenth Report of the Estimates Committees, have mostly emerged out of problem actually being faced by Engineers in the field. An important project in the lists is the Reduction in Transmission and Distribution losses. During the next 5 years, CBIP propose to take up studies on 106 similar problems, some of important being identification of factors leading to partial and forced outages in thermal power stations, harmful effects of flyash, wear and tear of coal conduits etc. These problems are related to improvement in operation of thermal power stations.

Similarly the CPRI has at hand, a number of problems of great practical importance, such as pollution in hydro reservoirs, evaluation of coal and water in Ennore thermal station, transmission line insulator pollution, re-cycling used transformer oil, field testing kit for transformer oil, cable fault locator, gas chromatograph etc. This institute has a large expansion programme during the next 5 years and they have included in this programme a number of problems which are basically oriented towards improved power station performance such as governor characteristics, up rating of existing transmission lines, radio interference and corona. Research for development of technology for meeting future needs such as development of insulation materials, high vacuum phenomena, SF6 technology, boiler turbine models, scale testing of UHV systems etc. are also included in this programme.

[M/O Energy, Deptt. of Power, O.M. No. 40(9)/78-Coord. 18 Nov., 1978].

Recommendation Sl. No. 86 (Para No. 8.15)

The Committee would further emphasise the need for costing of research projects in terms of time and money likely to be required for their completion. They consider that this would encourage and

promote cost consciousness in the staff engaged in research and would result in proper utilisation of time, energy and resources.

Reply of Government

The recommendation of the estimates committee at para 8.15 emphasising the need for costing of research projects in terms of time and money likely to be required for their completion, has been noted. One of the terms of reference to the Sub-Group, on R&D in the power sector referred to under recommendation 84 is to identify gaps in R&D and produce a time bound R&D programme for the next 5 to 10 years indicating therein the financial inputs required for various research projects. These research projects would then be monitored on both time, resources and output basis with a view to promote cost and result consciousness in the staff engaged on Research.

[M/O Energy, Deptt. of Power, O.M. No. 40(9)/78-Coord. 18 Nov., 1978].

Recommendation Sl. No. 87, (Para No. 8.16)

The Committee feel that if resources on research projects are to be utilised effectively and to the best advantage it would be very necessary that their progress is reviewed from time to time. The Committee desire that an objective assessment of the quality and usefulness of the research done should be made at least once in five years.

Reply of Government

In the case of CBI&P the progress on the various problems under study is reviewed every year during the annual Research Review Committee meeting which is attended by Chief Engineers, and Technical Members of the various State Electricity Boards. In addition, the Standing Advisory Committee on Research Scheme on Power consisting of eminent engineers also review in detail the progress that is being made on the problems twice in every year. The quarterly progress report that is being received from the various Research stations is reviewed by the CBI&P every quarter to examine any slippages and necessary remedial measures are taken. Also two Specialist Coordinators who visit the Research Stations under their jurisdiction from time to time, examine in person the work that is being carried out and advise them on various matters so as to carry out the studies in a more effective manner. Similarly in the case of CPRI there is a Technical Committee with Chairman,

CEA as the Chairman which reviews the progress of research projects that are being undertaken in CPRI at various stages and the findings of the Committee are reported to the Governing Council of CPRI. The Technical Committee also advises CPRI whether such projects are to continue or it can be closed as per the usefulness or otherwise of the various projects, from time to time. The Governing Council of CPRI also reviews progress of research problems.

The observations of the Estimates Committee that 'an objective assessment of the quality and usefulness of the research done should be made at least once in 5 years has been noted. One of the terms of reference to the Sub-Group on R&D in power sector, referred to earlier is to review the prevailing organisation structure of evaluation of R&D efforts and suggest a suitable mechanism for follow up.

[M/O Energy, Deptt. of Power, O.M. No. 40(9)/78-Coord. 18 Nov., 1978].

Recommendation Sl. No. 88, (Para No. 8.17)

The Committee would also like to lay particular emphasis that there should be widest dissemination of the results of research and the State Electricity Boards encouraged to utilise the same in the field expeditiously.

Reply of Government

The studies sponsored by CBIP are being carried out by the Research Stations established in the various State Electricity Boards and involve field studies. The results of such studies are implemented by the respective Boards even while the studies are being carried out. In addition, when the studies are completed, the completion reports are brought out as publications and circulated up to the level of Superintending Engineers all over India for effective implementation. A bi-monthly publication 'Irrigation and Power Research Digest' is being brought out by CBIP containing the important developments based on the studies that are being carried out and this is also circulated to the level of Superintending Engineers in the country for their guidance, information and implementation.

The results of research conducted by CPRI are normally brought out in the form of technical reports and also published in various technical journals in the country. The various technical forums and seminars are also made use of for disseminating the conclusions of

research findings of CPRI so that widest publicity is given to the appropriate quarters so as to encourage utilisation of the same.

[M/O Energy, Deptt. of Power, O.M. No. 40(9)/78-Coord. dated 18 Nov., 1978].

Recommendation Sl. No. 89, (Para Nos. 8.38 to 8.40)

The Committee in their 39th Report expressed their apprehension that non-availability of trained man-power for efficient and economic operation and maintenance of power project might become a major bottleneck if adequate steps were not taken in time in this regard. The Committee of Ministers appointed in 1972 had also pointed out the urgent need for developing technical manpower resources and recommended that training course should be drawn for all technical staff in a phased manner so that each person has to go through a course at the interval of 5—7 years.

The Committee note from the replies of Government that for the efficient operation of thermal stations, Government had set up two training Institutes in the Third Plan, one at Neyveli and the other at Durgapur. Two more institutes, one at Nagpur and the other at Delhi have also been established during the Fifth Plan period. These four institutes when fully developed can train 200 engineers and 400 operators every year. Apart from these, the States of Bihar, Madhya Pradesh and Andhra Pradesh have set up their own training institutes and West Bengal and Uttar Pradesh intend to do so shortly.

The Committee note that for the Fifth Plan period, 1750 supervisory personnel and 4000 operators are required to man additional units being commissioned. With the facilities available in the four institutes set up by the Central Government, *viz.*, training of 600 personnel annually, the Committee wonder whether the entire 5750 additional personnel required to man additional units during the Fifth Plan period would be imparted the requisite training. The Committee also feel that as suggested by the Committee of Ministers in 1972 each person should go through re-orientation courses at an interval of 5—7 years. The Committee need hardly point out that with the increasing accent on power expansion, the country would need more and more trained technical personnel to man the power stations. The Committee would, therefore, urge that a study may be undertaken to assess the requirements of technical personnel of various categories on a short term and long term basis and urgent steps taken by Government to augment the existing training facilities.

Reply of Government

The recommendations of the Committee have been noted and given careful consideration. The need for providing adequate facilities for the power engineers to equip themselves better, to be able to discharge their growing responsibilities has been accepted, and is engaging the attention of the Ministry constantly. The present arrangements, and the possibilities of improvement are Constantly under review.

The Central Electricity Authority have set up four training institutes at Neyveli, Durgapur, Delhi and Nagpur for training of personnel in operation and maintenance of thermal power stations. The ultimate training capacity of each Institute is 50 Supervisors and 100 Operators annually. In addition to these facilities, several State Electricity Boards have also established their own training centres|institutes to train lower level staff *i.e.* Artisans, Electricians, Controllers, Mechanics, etc. under the overall guidance of Central Electricity Authority to ensure that the training imparted by them in on a uniform basis throughout the country. In addition, power engineers are also sent abroad for training under various programmes such as UNDP, Colombo-Plan, VGB, Indo FRG, Indo-French Technical Cooperation agreement and Trade Agreement with U.S.S.R. Various management courses for technical personnel are also run by management institutes such as IIPA, New Delhi, ASCI, Hyderabad, IIM, Ahmedabad, National Productivity Council, New Delhi, IIM, Bangalore. Some technical personnel are also being deputed for refresher courses at the various IITs, University of Roorkee, College of Engineering, Gundey, School of Mines, Dhanbad etc.

Regional Training Boards have been established in Northern, Western and Eastern regions under the Chairmanship of Member (Power Systems), Central Electricity Authority. A similar Boards for Southern region is also expected to be established shortly. These Boards will take steps to assess the training requirements of the SEBs etc. in their respective regions and will guide the SEBs in regard to the need for additional training facilities as required.

Refresher courses are being held by the University of Roorkee and various IITs for in-service Engineers with an experience of 3 to 10 years. Additional special technical courses pertaining to the needs of the power. Engineers are also being organised by various

technical organisations like Central Fuel Research Institute, Dhanbad; Indian Istitute of Technology, Bangalore; NPC, New Delhi; Power Survey Training Institute, Bangalore etc.

A proposal to expand training cell in the Central Electricity Authority into a full-fledged Training-*cum*-Manpower Organisation under the Control of a Chief Engineer, and also to improve the management of the training facilities, is under consideration.

[M/O Energy, Deptt. of Power, O.M. No. 40(9)/78-Coord. dated the 18th November, 1978]

Recommendation Sl. No. 90, (Para No. 8.41)

The Committee note that only three States viz. Bihar, Madhya Pradesh and Andhra Pradesh have set up training institutes. It is surprising that while power development has been taken up in a big way and rural electrification has been given greater emphasis, many States have not come forward to set up Institutes for training more personnel in operation and maintenance of power stations. The Committee consider that the training requirements can be adequately met only if the States join in the endeavour with the Centre. The Committee would urge the Central Government to take up this matter with the concerned State Governments to augment the training facilities.

Reply of Government

The Central Electricity Authority, Ministry of Energy (Department of Power) have set up four Training Institutes at Neyveli, Durgapur, Delhi and Nagpur for training of personnel in operation and Maintenance of Thermal Power Stations. The ultimate training capacity of each Institute is 50 supervisors and 100 operators annually. The Institutes are not able to take up the number of trainees for which they have been established due to the lack of facilities and action is being taken to construct Institute building, Hostel, staff quarters and other facilities. The CEA has already formed Regional Training Boards for Northern, Western, Southern and Eastern Regions to guide the working of these Institutes. In the Board meetings, the training requirements of the respective States are fully discussed and SEBs are guided by these Regional Training Boards in their requirements for training at the National level Institutes as well as at respective state levels. In this connection, it may be mentioned that besides SEBs of Madhya Pradesh, Bihar and Andhra Pradesh other SEBs like Maharashtra, Punjab,

Tamil Nadu, Gujarat and UP have also set up training institutes for training of their staff in various fields like electricians, wiremen, operators etc.

[M/O Energy, Deptt. of Power, O.M. No. 40(9)/78-Coord. Dt. the 18 Nov., 1978)

Recommendation Sl. No. 92, (Para No. 8.43)

The Committee observe that the Committee on rural electrification in the Eastern States constituted in January, 1974, recommended that the States in the North-Eastern region should be provided help in training their personnel in design, construction, and maintenance of rural electrification works. The Committee learn that with a view to train suitable trainers of the rank of Assistant Engineers/Junior Engineers/Supervisors to impart training to the technicians engaged in rural electrification works in the North Eastern region, the Rural Electrification Corporation has so far arranged to get 14 such officers from the N.E. region trained at the training courses conducted by it. Further 3 more such trainers are undergoing training at the Third Training course now under progress at Hyderabad. The Rural Electrification Corporation has also commissioned the Institute of Applied Manpower Research, New Delhi to suggest suitable measures for staff development and training of the field staff for rural electrification in the North-Eastern Region, as also to review the training needs of the staff. The Committee also observe that the Corporation has decided to provide financial assistance of Rs. 12.00 lakhs from out of its special development fund for setting up 2 training centres in the North Eastern Region and that a sum of Rs. 2.00 lakhs has already been released to the Meghalaya State Electricity Board for setting up a Lineman Training Centre at Barapani which has started functioning since January, 1977, and that project report for setting up the second training Institute at Jorhat was awaited. The Committee would urge that the training facilities in the North Eastern Region need greater and special attention as these States are lagging far behind the national average in rural electrification. The Committee would also like to be informed of the recommendations of the Institute of Applied Manpower Research, New Delhi in this behalf and the steps taken to implement them.

Reply of Government

The project report of the Linemen Training Centre at Jorhat in Assam has been approved. The Centre has been commissioned

from 1st March, 1978. Two courses at this centre have been concluded and 47 linemen have been trained. The third course is in progress and 30 candidates are receiving training.

At the Linemen Training Centre at Barapani in Meghalaya, five courses have been concluded so far and 146 linemen have been trained. The sixth course is in progress and about 27 candidates are attending it.

43 Supervisory personnel of the five States and two Union Territories in the North Eastern Regions have received training.

The Institute of Applied Manpower Research submitted its report to the Corporation in November, 1977. The main recommendations of the Institute are as follows:—

(1) A Training Centre should be established in the North-Eastern Region for training of Assistant Engineers/ Junior Engineers. This should be fully equipped to take a group of 30 trainees at a time and should have facilities for demonstration of various equipments and material used in the construction of rural electrification works. Later when the demand increases, the Centre could consider the conducting two courses at the same time. This Training Centre should be headed by a person of the rank of Superintending Engineer and should be assisted by Executive Engineer. The Superintending Engineer-in-Charge would also be responsible for all the Linemen and other training centres in the North-Eastern Region.

(2) The two Linemen Training Centres at Barapani and Jorhat are sufficient for the time being to train Linemen, but the course duration could be reduced from three to two months.

The Corporation is at present eliciting the views of the concerned States in regard to establishment of a Regional Training Centre in the North-Eastern Region for the training of Assistant Engineers/ Junior Engineers as recommended by the Institute.

[Ministry of Energy, (Deptt. of Power) O.M. No. 40(9)/78-Coord. dated 18 Nov., 1978]

Recommendation Sl. No. 93, (Para No. 8.44)

In the matter of training on power system side, the Committee note that there is only training institute at Bangalore. The inadequacy of institute in meeting the training requirements is obvious

from the fact that Government are proposing to avail the help of UNDP for training 1000 Power System engineers, partly by deputing them to other advanced countries and partly by importing experts from UN Member countries. The Committee would like Government to assess the requirements of power system engineers and to prepare a short-term programme for immediate implementation and a long term perspective plan to train power system engineers to meet the demand.

Reply of Government

The requirement of engineers to be trained in the field of power systems is being assessed by the Central Electricity Authority. On receipt of the assessment, suitable action both on long term and short term basis would be taken, as considered necessary.

[Ministry of Energy, (Deptt. of Power) O.M. No. 40(9)/78-Coord. dated 18 Nov., 1978]

Recommendation Sl. No. 95, (Para Nos. 8.65 and 8.66)

The Committee note that a Committee of Ministers appointed in 1972 in their Report had recommended that the design units in the State Electricity Boards, Electricity Departments, the specialised engineering organisation of CW&PC (now CEA) and consulting engineering firms will have to develop and expand suitably in view of the ever large programme of new projects and the need for greater design and engineering support for better project execution. The Committee were informed during evidence that the CEA are designing the thermal power stations, hydro electric power stations and transmission systems and on the basis of regular feedback of operational and maintenance data, improvements in the new station design and system design are made.

The Committee need hardly point out that the designs of power stations will have to incorporate the latest and the most appropriate technology so that generation, transmission and distribution of power are most efficient and entail minimum of losses. The Committee attach great importance to feedback of information on operation and maintenance from the project levels so that necessary correctives could be applied and lessons learnt leading to new improved station and system design etc. The Committee would also like Government to take concrete steps to strengthen and augment the design units at various levels.

Reply of Government

The Central Electricity Authority is being adequately strengthened in its Thermal, Hydro and Transmission Wing for greater design and engineering support for execution of power projects. The feedback information on operation and maintenance is being used for taking steps, to get better output.

(Ministry of Energy (Deptt. of Power) O.M. No. 40(9)|78-Coord. dated 18 Nov., 1978].

Recommendation Sr. No. 96, (Para No. 8.67)

The Committee note that the Minister of Industry and Civil Supplies at the Conference of State Power Ministers held in July, 1976 had remarked that equipment required for transmission and distribution of power should be standardised, so as to ensure speed and stability. The Committee note that as far as the equipment for low voltage transmission|distribution system pertaining to the rural electrification was concerned. REC had set up a cell for standardisation of these equipments under the overall charge of a Chief Engineer. The standardisation was being done in consultation with the various State Electricity Boards. Indian Standards Institution, Central Electricity Authority, manufacturers and other connected agencies through the forum of Helping and Technical Committees and by organising standardisation on conferences. The Committee are glad to be informed that in terms of quantum of standardisation 90 per cent of the value of all equipment required had been covered. They would like that effective steps should be taken to standardize the remaining equipment expeditiously.

Reply of the Government

The Corporation has so far issued 13 standard specifications, 87 construction standards and 13 manuals. Standard specifications and construction standards in respect of following items are being prepared by the Corporation:—

Standard Specifications:

(i) 33 KV Circuit Breakers

(ii) 33 KV Insulators and Fittings

(iii) PCC poles with Factor of Safety 2.5 (in lieu of specification issued earlier in the form of circular letters).

(iv) Single wire earth return distribution transformers.

Construction Standards:

(i) Supports and Spans for 33 KV lines.

(ii) Steel Cross Arms for 33 KV lines.

(iii) 11 KV Cables for 33|11 KV sub-stations.

(iv) Angle iron cross arms for 11 KV lines.

These have been cleared by the Technical Committee on Standardisation and are proposed to be placed for consideration before the next conference on Standarisation.

The Corporation has also initiated action regarding standarisation of specifications for higher voltage, *i.e.* 66/11 KV sub-stations etc. and some important items of consumers' interest.

[Ministry of Energy (Deptt. of Power) O.M. No. 40(9)|78-Coord. dated 18th November, 1978]

Recommendation Sl. No. 97, (Para No. 8.68)

The Committee also note that for the higher voltage transmission|distribution equipment, Government have approached the World Bank for IDA loans, as the standardisation has to be made in such a manner as to satisfy not only the Central Electricity Authority but also the World Bank and the IDA. The Committee would urge Government to expedite the matter and take necessary action for a standardisation of higher votage transmission|distribution equipment at the earliest.

Reply of Government

Under Chairmanship of Member (PC), Central Electricity Authority, a Committee was constituted to make recommendation on the parameters and specifications for major items of 400 KV transmission. The Committee have submitted its report and the report it being circulated to various State Electricity Boards|other Power Projects and utilities by the Central Electricity Authority.

[Ministry of Energy (Deptt. of Power) O.M. No. 40(9)|78-Coord. dated 18th November, 1978]

Recommendation Sl. No. 98, (Para No. 8.74)

The Committee note that the Rural Electrification Corporation has identified few R&D areas for developing cheaper and better equipment and materials and has achieved results in some of these areas. The Committee need hardly stress that greater attention should be paid to identify more and more areas for developing cheaper and better equipments which would result in considerable economy in expenditure. The Committee would like the REC to step

up their R&D activities and go in for large scale development of cheaper equipment and materials.

Reply of Government

The Rural Electrification Corporation is making efforts to identify and take up more projects with a view to minimising the cost of rural electrification as also to increase operational efficiency.

[Ministry of Energy (Deptt. of Power) O.M. No. 40(9)|78-Coord. dated 18th November, 1978]

Recommendation Sl. No. 99, (Para Nos. 9.29 to 9.31)

The Committee note that a new process called 'Magnetohydrodynamics' which converts heat energy directly into electricity through the inter-action between all electrically conducting fluid and magnetic field is being tried in various countries. The efficiencies obtained through MHD conversion process are stated to be higher than the conventional process. The Committee further note that the MHD process enables energy extraction of the order of 20—30 per cent of the total energy input to the hot gases, depending on the strength of magnetic fields. It has also been stated that a combination of the MHD and conventional power cycles makes it possible to achieve higher over-all thermal efficiencies of 50—60 per cent as compared to 37-38 per cent possible from a conventional system. As the MHD has the potential of raising the overall thermal efficiency of power generation considerably, its adoption would lead to saving of sizeable quantity of fuel, which is important in the present context of world energy situation. The other advantages of the MHD technology will be to minimise air pollution at no cost to the consumer, and it will enable to minimise in the long run, the thermal pollution of rivers and lakes.

The Committee note that leading countries like USSR, USA and Japan are making sustained efforts to develop MHD technology and have increased their efforts in this field. It is noted that USSR has a 25 MW(e) demonstration plant in operation since 1971, and often this plant had been operated as a commercial unit for study purposes and the results had been encouraging. Based on this experience construction of a 1000 MW(e) commercial MHD Power Station has been started in USSR which is expected to be ready by 1981. Even West Germany and U.K. which had de-emphasised MHD programme in favour of nuclear power, are now considering to re-activate the programme due to the new development of MHD and the energy crisis.

The Committee note that initiative has already been taken to establish an experimental plant of 5 MW based on the principle of Magnetohydro-dynamics at Tiruchi under an agreement with the USSR. The Committee would like the Government to keep in touch with the progress made in the field all over the world so as to see that experimental plant being set up in our country incorporates the latest technology. Careful evaluation of its suitability and economics may be undertaken to ensure conclusive follow up action.

Reply of Government

The observations of the Committee are noted.

MHD research programme is being funded by the Department of Science and Technology. The Bhabha Atomic Research Centre, Bombay and M|s. Bharat Heavy Electricals Ltd., are participating in it. Both these organisations are now fully geared up to the setting up of the pilot project for MHD-topped steam turbine plant by 1981 in Tiruchirapalli.

Unlike the practice mostly followed elsewhere, the Indian MHD project involves use of coal gas (as opposed to oil or natural gas) as the fuel for the MHD generator. This is mainly in view of the fact that coal is the country's major natural fuel resource. The programme involves gasification of coal and using of low calorific value gas formed thus as fuel. In the MHD process, coal gas will be mixed with hot air and burnt in a combustor to obtain hot plasma at a temperature of about 2900 K. At this stage, some seeding with alkali metals will also he done to increase the electrical conductivity of the hot plasma. The plasma, formed in the combustor will be made to flow through a segmented electrode MHD generator at a velocity of 1000 metres per second. DC electricity generated in the MHD generator will be inverted to A.C. The exhaust plasma from MHD generator would be used further in a conventional steam power plant. The Pilot plant of BHEL will have a thermal input rating of 5 MW with provisions for extending it to 15 MW.

A Committee under the Chairmanship of Secretary, Department of Science & Technology and with the following as members has been constituted to co-ordinate direct, monitor and evaluate of the project—

1. Secretary, Heavy Industry
2. Director, BARC, Bombay

3. Adviser (Energy), Planning Commission
4. Member (Thermal), CEA
5. Director (Engg.), BHEL
6. F. A., Department of Science & Technology
7. Director, Deptt. of Science & Technology.

The Committee is expected to make a critical evaluation of the technical and economic feasibility of the MHD technology after the Pilot Project is set up.

[Ministry of Energy (Deptt. of Power) O.M. No. dated the 18th November, 1978]

CHAPTER III

RECOMMENDATIONS/OBSERVATIONS WHICH THE COMMITTEE DO NOT DESIRE TO PURSUE IN VIEW OF GOVERNMENT'S REPLIES

Recommendation Sr. No. 6, (Para No. 2.55)

The Committee note that there have been wide disparities in developing the hydro-electric potential in the various regions and States in the country. The percentage of hydro-electric potential development at the end of the Fourth Plan was 31.72 in the Southern Region, 14.02 in the Northern Region, 13.79 in the Eastern Region, 12.52 in the Western Region and 0.30 in the North Eastern Region. The disparities in the development of the potential in the various States also very wide. While the percentage developed was 116.73 in Tamil Nadu, 41.12 in Maharashtra, 35.42 in Kerala, 29.49 in Punjab, Haryana etc., it was only 12 in U.P., 8.49 in Andhra Pradesh, 2.45 in Madhya Pradesh and 1.60 in Jammu and Kashmir at the end of the Fourth Plan. The development of potential at the end of 1978-79 region-wise, would be 45.98 per cent in the Southern Region, 26.02 per cent in the Northern Region, 16.60 per cent in the Eastern Region, 15.78 per cent in the Western Region and 0.54 per cent in the North Eastern Region. Even at the end of the 1983-84 according to the present indications, the development region-wise would be 70.99 per cent in the Southern Region, 33.71 per cent in the Northern Region, 29.90 per cent in the Eastern region, 17.84 per cent in the Western region and 1.94 per cent in the North Eastern Region. The development of the potential in the various States at the end of 1978-79 would range from 2.13 per cent in Sikkim to 142.32 per cent in Tamil Nadu. The Committee are greatly concerned at this imbalance in the development of hydro-electric power as compared to the known potential in the various regions/States in the country.

Reply of Government

The Hydro Electric resources are not evenly distributed in the various States/Regions of the country which also generally holds good in respect of coal fields which meet the requirement of Thermal Power Stations. The development of hydro resources in a particular State/Region depends upon several factors such as the availability of un-developed potential, anticipated requirements of the

State/Region, the economics of generation, *vis-a-vis* other alternative modes of generation readiness of the hydro schemes for implementation and the possibility of completing the scheme within a given time horizon. Inter-State aspects, where these arise, need to be resolved before hydro-electric schemes can be taken up.

[Ministry of Energy (Deptt. of Power) O.M. No. 40(9)|78-Coord. dated 18th November, 1978]

Recommendation Sl. No. 17, (Para No. 2.117)

The Committee also note that some investigations are being conducted in the field of Geo-thermal energy to find its possible uses, but these are at a preliminary stage. They hope this source of energy will also receive due R & D attention.

Reply of Government

Geo-thermal manifestation in the form of hot-springs occure in several regions of the country. The most important among these are in the North Western Himalayas and along the West-coast. The main activities in the geo-thermal field in the country are directed towards location of promising hydro-thermal reservoirs for power generation and other possible uses of the heat energy. Geo-thermal explorations are being continued at Puga in Jammu and Kashmir, in Parbati Valley in Himachal Pradesh and along the West Coast. The present indications are that while geo-thermal energy may have importance in some areas in the longer time-frame, the overall extent to which it will be a source of power generation would be extremely small.

[Ministry of Energy (Deptt. of Power) O.M. No. 40(9)/78-Coord, dated the 18th Nov., 1978]

Recommendation Sl. No. 21 (Para Nos. 2.140 and 2.141)

The Committee in paragraph 3.189 of their 39th Report (1972-73) had expressed their unhappiness at the dismally low *per capita* consumption of electricity in the country which was 93 Kwn in 1971-72 compared to the world average of 1200 Kwh. They had noted that even at the end of 1977-78, the *per capita* consumption of electricity was anticipated to be only 200 Kwh as against the *per capita* consumption of 1000 Kwh in the USA and 2000 to 3000 in Europe. The Committee are very much perturbed to note that even the anticipated 20 Kwh *per capita* consumption of electricity by 1978-79 is now not likely to be achieved before the end of the Sixth Plan *i.e.* 1983-84.

The Committee are not convinced by the reasons advanced by the Ministry that the target of 200 Kwh of *per capita* consumption at the end of the Fifth Five Year Plan 1978-79 related to the total generation of electricity. Considering that *per capita* consumption of electricity in 17 countries out of the 28 developing countries was above 200 Kwh in 1974-75 and in 6 of them, it was over 1000 Kwh, it is evident that the target of 200 Kwh of *per capita* consumption by the end of 1978-79, was a very modest one. It is regretted that even this modest target is proposed to be achieved by the end of the 1983-84. The Committee need hardly stress that power is an essential input for agricultural, industrial and economic development of the country. It is, therefore, imperative that there should be an acceleration in the programme for development of power. They would, therefore, like Government to prepare an accelerated programme for the development of power—hydel, thermal and nuclear so as to achieve the target of 200 Kwh *per capita* consumption of electricity at the earliest. The Committee have no doubt that if the programme for development of power is accelerated the target of 200 Kwh would be achieved earlier than the end of 1983-84.

Reply of Government

The observation of the Committee is noted.

The demand for power is a derived one and consumption of electricity depends primarily on the economic activity. The draft Five Year Plan for 1978—83 has projected energy requirement to about 129 billion units in 1982-83 and to 206 billion units in 1987-88. In order to meet this requirement, a power programme involving addition of installed generated capacity of 18,500 MW and complimentary programme of transmission and distribution during the Plan period have been proposed in the Plan. This programme would enable the per capita consumption to reach a level of about 200 Kwh by 1983-84.

[Ministry of Energy (Deptt. of Power) O.M. No. 40(9)/78-Coord, dated the 18th Nov., 1978]

Recommendation Sl. No. 26 (Para Nos. 2.174 to 2.176)

The Committee find that in so far as Fifth Plan is concerned, the target for additional installed capacity of 16.55 million KW as originally envisaged in the draft plan document has been steeply scaled down to 12.5 million KW. The Committee have already commented on this reduced target for Fifth Plan earlier in this Chapter.

The Committee note that during the first two years of the Fifth Plan, the capacity added was only 3.52 million Kw and during the third year *viz.*, 1976-77, the target was 2 million KW. The Committee observe from the Annual Report of the Ministry of Energy (Paragraphs 3.35 to 3.37) for 1976-77, that out of this targetted additional capacity of 2 million KW, only a capacity of 0.64 million KW till 30th November, 1976 has been achieved, and the construction works of some of the projects scheduled for commissioning during that year with capacity totalling 1.276 million KW were still at various stages of completion. The Committee would like to point out that even if the target of 2 million KW were achieved during 1976-77, the balance additional capacity left to be built up during the last two years of the Fifth Plan would be about 7 million KW.

The Committee have been assured by the Ministry of Energy that no shortfall is expected in the achievement of the revised physical target during the original Fifth Plan period *i.e.* 1974-75 to 1978-79. The Committee have no doubt that Government are fully aware of the stupendous nature of the task before them, namely, of additing a capacity of more than 7 million KW in the last two years of the original Fifth Plan *i.e.* 1977-78 and 1978-79 against a likely achievement of 5 2 million KW during the first three years of the Plan. Needless to say, that if the target is to be fully achieved, Government will have to redouble their efforts and ensure that there is no complacency or slippage at any level and bottlenecks, if any, are immediately, identified and removed through a system of strict monitoring of the projects under construction.

Reply of Government

The Fifth Five Year Plan had programmed an addition of 12,500 MW of generating capacity over the five year period. The actual additions to installed capacity during the period 1974—78 was about 7197 MW as indicated in the table below:—

Year	Addition to installed capacity MW
1974-75	1725
1975-76	1804
1976-77	1712
1977-78	1956
	7197

A target of 3857 MW has been fixed for the current year *i.e.* 1978-79. The projects included in this programme are being continuously monitored to ensure that they are commissioned according to schedule.

A number of steps were taken to expedite the commissioning programme during the 5th Plan and a system of monitoring implementation of projects was also introduced. The various steps taken to expedite commissioning of projects are indicated in reply to recommendation No. 25.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18 Nov., 1978].

Recommendation Sl. No. 29 Para Nos. 2.204 to 2.206

The Committee note that no time schedule has been laid down for examination and clearance of power projects. According to the Ministry, the time taken depended on, among other factors, the quality of project preparation cross checking of data collected, the complexities of the project features and the extent of inter-disciplinary consultations and therefore the time taken would vary from the project to project. It has also been stated by Ministry that a project was deemed to be ready for implementation only when the techno-economic examination had been completed and the investment decision taken. The Committee have been informed that it was difficult to make any comment on the impact of time taken in project preparation and clearance on the cost of the project.

The Committee observe that as per provisions of the Indian Electricity (Supply) Act every scheme estimated to involve a capital expenditure exceeding Rs 1 crore is required to be submitted to the Central Electricity Authority for its concurrence. This Authority carries out detailed techno-economic examination of the project to make sure that it is justified on techno-economic consideration before giving concurrence. After techno-economic examination in the various specialised formations of the C.E.A., the scheme is discussed at the full meeting of the CEA and the representatives of the Planning Commission is co-opted as a part-time Member of the CEA when the project is discussed. The C.E A. then conveys its approval to the Ministry of Energy who then approach the Planning Commission for formal approval to the inclusion of the project in the Plan.

The Committee find from a list furnished by the Ministry of some hydro-electric projects indicating the time taken for tech-

nical examination that in the case of 7 projects technical examination was completed within a year, in the case of 13 projects, it took between one and two years; and in the case of 18 projects, the time taken exceeded 2 years and in a few cases it took 6 years and more. While the Committee realise that the process of technical examination of projects takes time they do not see any justification for taking more than a year in this process as preparation of project reports may have already taken its own time. The Committee feel that the Ministry should streamline the procedure for technical examination and issue guidelines indicating in detail about the kind of technical and other relevant data which should be submitted by the State Governments, so that all avoidable delays in obtaining clarifications are obviated and the projects are cleared for investment decisions expeditiously. The Committee would like to be apprised of the steps taken in this regard. The Committee need hardly emphasise that delays in the preparation of project reports and their sanction result in escalation of costs, apart from belated supply of power. The Committee would also like to emphasize that when a project is once cleared by the Central Electricity Authority from techno-economic angle after a full and detailed examination with which representative of Planning Commission is also associated there should be no case for reconsideration of the Project from techno-economic angle by either the Ministry of Energy or the Planning Commission and the clearance given by the Central Electricity Authority should be treated as final.

Reply of Government

The Central Electricity Authority is charged with the responsibility for the detailed examination of all power schemes and their techno-economic appraisal. After the schemes are approved by the CEA from the techno-economic angle, these are recommended to the Planning Commission by the Department of Power, for investment approval.

In order to cut down avoidable delays in obtaining clarifications from the project authorities and thus ensuring their expeditious clearance, in so far as hydro-electric projects are concerned, the CWC have already issued "Broad Guidelines for Preparation of Project estimates for Major Irrigation and Multipurpose Projects". The CEA have also issued a mannual for investigation and preparation of project report. It may be mentioned that for the power development plan for 1978—83, the CEA has already accorded techno-economic approval to all the generation schemes except a few which involve inter-State aspects, for yielding benefits upto the end of 1982-83.

After their clearance by the CEA, the projects are recommended to the Planning Commission for investment approval. The Planning Commission examines the power projects from the investment angle, keeping in view the size of the overall Plan, the sectoral Plan, allocation in the State's Plan and the availability of resources of the State Plan. The Central Electricity Authority establishes the techno-economic feasibility of a project, whereas the Planning Commission does look into aspects of investment clearance for the project in a particular time-frame, keeping in view the requirement as well as resource availability. Thus the roles of the two agencies are not repetition or duplicating and each must play its part.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18 Nov., 1978].

Recommendation Sl. No. 35 (Para 2.264 to 2.267)

The Committee in their 39th Report (1972-73) had expressed great concern about the acute power shortage in the country which had been responsible for retarding the development of the country's economy both in the industrial and agricultural sectors. The Committee in their 56th Report on the action taken by Government on the recommendations contained in their 39th Report, noted the steps taken by Government to overcome the shortages in power supply and stressed that in view of the continuing power crisis concerted measures should be taken to overcome the power shortages and continuous watch kept to remedy the bottlenecks in power generation.

The Committee note further that a number of measures have been taken to augment the availability of power in the country and ensure rational and suitable distribution with a view to meeting the essential requirements of all the priority sectors of economy. In spite of the steps stated to have been taken by Government, the Committee cannot help observing that the position is still far from satisfactory.

The Committee have been informed that the requirement of power in the years 1974-75, 1975-76 and 1976-77 was 77,600, 83508 and 88489 Gwh respectively, and the availability during these years was 66647, 74909 and 83365 Gwh. So far as the remaining two years *viz.* 1977-78 and 1978-79 are concerned, the anticipated requirement during these years would be 100260 and 111891 Gwh and the availability would be 93734 and 109040 Gwh. The Committee would also like to point out that there is not a single State or Union Territory in the country where the supply of power has kept pace with

the requirements and what causes more concern is that the shortage is likely to persist for the years to come.

The Committee note that particularly in the States of Haryana, Uttar Pradesh, Punjab, Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Tamil Nadu and West Bengal, the gap between the availability and anticipated requirement at the end of 1978-79 will continue to be very wide. Thus the total power picture that emerges is one that cannot but cause great deal of anxiety.

Reply of Government

The installed generating capacity (including utilities) in the country at the end of 1976-77 was 24040 MW comprising of 21815 MW in utilities and additional generating capacity of 1956.5 MW was added, thereby raising the total capacity in the country to 25996 5 MW. The regionwise break-up of the installed capacity is given below:

(Figures in MW)

Region	Hydro	Thermal	Nuclear	Total
Northern	3244	3240	220	6704
Western	1684	4085	420	6189
Southern	4118	1987	..	6105
Eastern	885	3618	..	4503
North-Eastern	80·5	190		270·5
Sub-total Utilities	10,011·5	13,120	640	23,771·5
Non-Utilities				2,225
GRAND TOTAL				26,996·5

The total generation in utilities during 1977-78 was about 92196 MU, of which generation from thermal and nuclear plants was 54236 MU and generation from hydro-electric plants was 37961 MU.

During the year 1978-79, new generating capacity of 3857 MW is targetted for commissioning. Generation of energy during the year is projected to 105630 MU from utilities, comprising 64670 MU from Thermal and 40960 MU from hydel sources. This will represent an increase of about 15 per cent over the actual generation during the last year. There has been an overall increase of about 14 per cent in the energy generation during the past six months 1978-79 as compared to the corresponding period last year.

There has been a marked improvement in the availability of power in most of the States during this year. As a result power cuts/restrictions in several States have either been lifted or considerably relaxed.

The power supply position has been satisfactory in the following States/Union Territories since the beginning of the current financial year.

Northern Region	Himachal Pradesh, Haryana, Chandigarh
Western Region	Gujarat
Southern Region	Andhra Pradesh, Kerala, Tamil Nadu and Pondicherry
Eastern Region	Orissa
Northern Eastern Region	Arunachal Pradesh, Meghalaya, Mizoram and Nagaland.

Power and energy

Power and energy cuts in J&K and Rajasthan have been completely lifted from July, 1978 onwards. In Delhi, there are marginal energy cuts imposed on various consumers in addition to restrictions during peak load hours. Punjab has imposed peak period restrictions on industrial consumers. In U.P. power cuts have been lifted except for some peak period restrictions on various types of consumers. Demand cuts are also in force in respect of some types of continuous process industries. In Madhya Pradesh, some relaxations in power cuts/restrictions were given during the period May to July, 1978. However, from August, 1978 the power cuts had to be increased due to lower availability of power, Karnataka was having energy cuts varying from 10 to 55 per cent on different categories of industrial consumers since October, 1977. These cuts were progressively relaxed during June to September, 1978 due to improved availability of power. The cuts have, however, been revised from 1st October, 1978. In the Eastern Region, the power supply position in all the States except Orissa has been one of difficulties. In West Bengal there are demand cuts imposed on various categories of consumers, excepting the Jute Mills and Cotton Textile Mills. In addition, restriction in use of power during the peak load hours is also in force on various consumers. Although these are no notified cuts in Bihar, load shedding is being resorted to in the State in a day to day basis depending upon the availability of power. Orissa is having surplus of power and has been able to assist Bihar and DVC systems in meeting their power demands. The power availability in DVC has

improved slightly during the recent months due to the better performance of the thermal generating units in the system.

In the North Eastern Region, power and energy cuts of varying degrees are in force on various types of consumers in Assam, in addition to peak load restrictions. In Manipur and Tripura, peak load restrictions are in force.

The power supply position in the country is being monitored and reviewed continuously at the State, Regional and the Central level and immediate and short-term measures are being taken to relieve the shortages. Integration of the power system operation at the Regional level is being ensured to the extent technically feasible and transfers of power from surplus to deficit system are also being arranged on both day to day and short term basis. These measures have led to improvement in the reliability and quality of power supply in systems which are facing critical shortage in availability.

A broad review of the power supply position for the period up to March 1979 indicates that in the Northern Region, while the energy availability would be adequate to meet the requirement, peaking shortages would continue, particularly in U.P. In the Western Region, shortages will continue in Madhya Pradesh and Maharashtra. Gujarat will have adequate availability to meet its requirements. In the Eastern Region, the peaking shortage in West Bengal and DVC Systems will continue. Orissa will be in a position to provide some relief to DVC and Bihar System. No significant change is anticipated in the North Eastern Region.

The power programme for the future is being formulated with the objective of achieving self-sufficiency in power availability in all the regions in a time frame of 5 to 7 years. The draft five Year Plan 1978—83 accords high priority to power development and envisages addition of 18500 MW of capacity by the end of 1982-83. The successful implementation of this programme and the steps being taken to maximise generation from existing facilities would improve the overall power availability in all the regions and it is expected that it will be adequate to meet the demands by and large in most parts of the country.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18 Nov., 1978].

Recommendation Sl. No. 50, (Para No. 4.17)

The Committee further note that in order to facilitate integrated operation of systems on a Regional basis and to coordinate the activities of the State/System Load Despatch Centres for ensuring

optimum utilisation of generation and transmission facilities in the region, regional Load Despatch Centres are required. The Committee find that so far the Government have established only Interim Regional Load Despatch Centres in the Northern, Western, Southern and Eastern Regions and one such Centre in the North Eastern Region would also be commissioned soon. As regards permanent Regional Load Despatch Centres are concerned, the Committee were earlier informed that the bulk of the work pertaining to the establishment of Regional Load Despatch Centres would be completed during the fifth plan period. The Committee were also informed that while the first phase of the Southern Regional Centre would be commissioned in December, 1976, and the second phase in 1978, the Centres in Northern, Western and Eastern Regions would be in operation by 1980-81. The Committee, however, find that while the first phase of the Southern Regional Centre was expected to be commissioned "in about two months" from December, 1976, specifications for equipment for the Regional Load Despatch Centres, in Northern Western Regions were still stated to be under preparation and procurement action for the equipment would be initiated by floating of tenders under the IDA Transmission Credit after the specifications were ready. The Committee need hardly stress the importance for setting up of Regional Load Despatch Centres at an early date. The Committee trust that Government would ensure that these permanent Centres would be in operation by the Targetted time namely 1978 for the Southern Region and 1980-81 for the other three regions.

Reply of Government

In order to coordinate the activities of existing State Load Despatch Centres (SLDCs) on a Regional basis, with a view to ensuring optimum utilisation of generation and transmission facilities, the Regional Load Despatch Centres (RLDC) in Northern, Western and Eastern Regions have been set up on an interim basis and these are working on shift basis with minimum of speed and teleprinting facilities.

As regards the delay in the setting up the permanent RLDC in Northern, Western and Eastern Regions, the original sanctioned schemes provided for a microwave communication system owned and operated by the REBs. The P&T Deptt. did not agree to sanctioning the microwave system for REBs and this led to the revisions of the entire project Report. The change of building site for RLDC in the Northern Region from Badarpur to Hauz Khas and the acquisition of land for the RLDC building in Western and Eastern Regions also contributed to the delays. The Project Reports for the RLDCs

in Northern, Western and Eastern Regions have since been revised. Global tenders for load despatch equipment under IDA Transmission Credit were opened on 13-2-1978. The tenders are being analysed. The detailed purchase orders for the equipment are likely to be placed by the end of October, 1978 and the delivery of the equipment is likely to be completed by October, 1980. The installation, testing and commissioning of the various items of equipment in the Northern and Eastern Regions will take another one year and thus the RLDCs are expected to be operational by the end of 1981.

In the case of Eastern Region, while the same procedure is being followed, the scope of the RLDC project involves certain works to be carried out in the State Power System (*i.e.* between the Power Stations/substations and State Load Despatch Centres). Further, the construction of building for RLDC which has been entrusted to CPWD will take about 9 months more compared to the time which CPWD would take for the construction of similar building in Northern and Western Regions, because pile-foundations are required in view of the soil conditions. Thus the RLDC in the Eastern Region is expected to be operational by the end of 1982.

The implementation of Phase-I scheme of the RLDC in the Southern Region is complete. The despatch functions on a permanent basis have been started from the permanent RLDC building equipped with mosaic system diagram board, PLCC, teleprinting and telemetering equipment. The LFC equipment covered under Phase II has been received and is being installed. It is expected that Phase II of the scheme will be commissioned by early 1979.

[Ministry of Energy (Department of Power) O.M. No. 40(9)/78-Coord, Dated the 18 Nov., 1978]

Recommendation Sr. No. 67, (Para Nos. 5.91 to 5.93)

The Committee note that a high powered Committee named the "Committee on Rural Consumers' Complaints" had gone into the difficulties faced by the rural consumers of electricity and made a number of recommendations for remedial action to mitigate the difficulties.

The Committee note further that the Report has been generally accepted by all the State Electricity Boards and many States have already initiated a number of measures in implementation of recommendations of the Committee on Rural Consumers' Complaints.

The Committee hope that the progress of the implementation of the recommendations of the Committee on 'Rural Consumers' Complaints' made by the State Electricity Boards would be monitored through periodical reports so that the difficulties faced by the rural consumers are removed and necessary assistance rendered.

Reply of Government

The Committee appointed to "Examine the difficulties faced by the Agriculturists and other consumers in rural areas in the matter of electric power supply and to suggest remedial measures" had been set up in September, 1972 and it had given its Report in December, 1973. As already stated, Government's decisions on the various recommendations of the Committee had been communicated to all State Electricity Boards, who had also been asked to implement them. Replies received from the State Electricity Boards had also been carefully considered and instructions given wherever required. The implementation of the recommendations is now the responsibility of the State Governments and State Electricity Boards.

[Ministry of Energy (Department of Power) O.M. No. 40(9)/78-Coord, Dated the 18 Nov., 1978]

Recommendation Sl. No. 73, (Para Nos. 6.53 to 6.55)

The Committee note that a system study has been made to determine the economics of rail-*cum*-sea movement of coal as against all rail-movement of coal for the transportation of coal from the Bihar-Bengal coal-fields through Haldia to Madras Tuticorin and Trombay thermal Stations. According to this study the Committee note that if suitable type of Ship is used and proper system of loading and unloading is adopted, the average cost of transportation of coal to these three stations would not only compare well with rail movement but would in fact be cheaper. The cost of transportation of coal by rail-*cum*-sea route from Bihar—Bengal coalfields to Madras, has been estimated as Rs. 68 per tonne as against Rs. 88 by rail route. Similarly as against the present all rail cost of Rs. 125 per tonne for tuticorin, the rail-*cum*-sea transportation charges are estimated to come down to Rs. 86 per tonne.

The Committee were earlier informed that necessary action for acquisition of second hand bulk cargo vessels of 35000 DWT and for providing shore facilities at Madras and Tuticorin by 1980 at an estimated cost of Rs. 5.50 crores has been initiated and was awaiting approval of the Public Investment Board. In a later note (December, 1977), the Committee have been informed that subsequent decisions taken in the Department of Coal has ruled out the possibility

of coastal movement of coal through the Madras Port. Thus movement of coal by the coastal route is now required to be done only to the Port of New Tuticorin. Interim facilities have been provided at one of the existing berths in the port till mechanised facility is completed. As regards acquisition of large vessels the Ministry have informed (December, 1977) that since in the present market conditions it is possible to acquire vessels, particularly second-hand vessels, at short notice and other alternatives such as conversion of existing vessels, were being considered for carriage of coal, it was decided to prepare an EFC paper which has now been circulated for the construction of a coal jetty at the Port of New Tuticorin.

The Committee are unable to appreciate in the absence of detailed statement of reasons, the decision taken in the Department of Coal, ruling out the possibility of coastal movement of coal to Madras Port, though it would appear that advanced action for such movement of coal was initiated and proposal were awaiting approval of the Public Investment Board. The Committee would like to be apprised of the difficulties leading to the giving up of movement of coal to Madras Port to feed the thermal stations. As regards the movement of coal to the Port of New Tuticorin, the Committee would like Government to make concerted efforts in close coordination with State Government of Tamil Nadu to ensure that the necessary facilities are available at the New Port of Tuticorin in time so that there is no bottleneck in the coastal movement of coal to that Port affecting the commissioning schedule of the Thermal Power Station being set up at Tuticorin.

Two points have been raised in the above recommendations and these are:—

(a) the reasons for the decision taken in the Department of Coal ruling out the possibility of coastal movement of coal to the Madras Port; and

(b) making concerted efforts in close coordination with the State Government of Tamil Nadu in regard to the coastal movement of coal to the port of new Tuticorin for the thermal power station being set up there.

Regarding the first point, it may be mentioned that the power station, for which coastal movement of coal to the Madras Port is required to be undertaken, if at all, is the Basin Bridge Power Station of the Tamil Nadu Electricity Board. In the system study referred to in the aforesaid recommendation the consultants who

carried out that study estimated a demand of 0.18 million tonnes per annum of Grade I coal from the Raniganj Coalfields for this Station, which would have to be moved by Rail-*cum*-sea route. In January, 1977, the Tamil Nadu Electricity Board indicated that Grade-I coal available from the Chanda coalfield could meet the requirement of the Basin Bridge power station and that they were no longer interested in receiving Raniganj coal by the rail-*cum*-sea route. As a matter of fact, there had been no rail-*cum*-sea movement of coal for this power station since August, 1976 and the entire coal, including coal from the Raniganj coalfield, was supplied by all rail route. It was in these circumstances that it was visualised in 1977, that there would be no movement of coal by rail-*cum*-sea route to the Madras Port for meeting the requirement of the Basin Bridge Power Station.

The movement of coal for this Station by the all rail route become difficult in February, 1978, when because of the cyclonic storm in Andhra Pradesh, rail traffic in Vijayawada Sector got seriously dislocated. Thereafter, as an interim measure, 8000 tonnes of coal per month is being supplied to this Station from the Raniganj coalfield by the rail-*cum*-sea route and the balance requirement of 27,000 tonnes per month by the all rail-route from Singareni Collieries and Chanda Coalfields. This is not likely to be a permanent linkage and will be terminated as soon as coal availability from alternative nearer sources and the wagon position improve.

This Department disburses a subsidy for coal moved by rail-*cum*-sea route, the amount of subsidy representing the difference between the cost of transportation by rail-*cum*-sea route and that by all rail route. This Department comes in the picture in the transportation of coal by rail-*cum*-sea route only on this account. The subsidy comes out of a fund which is meant largely for coal conservation measures and a number of other associated purposes connected with coal mines. Disbursal of subsidy from this fund for rail-*cum*-sea movement therefore reduces the resources available for conservation and other purposes. It is for this reason that grant of this subsidy is linked only to that quantity of coastal movement of coal which the Railways are unable to move by all rail routes. If, according to System study referred to above the cost of transportation of coal by rail-*cum*-sea route through Haldia Port ultimately works out to be cheaper than the cost of transportation by all rail route, no subsidy needs to be paid. This Department would not then come in the picture at all and they would have no objection to the transportation of coal either by the rail-*cum*-sea route or by the all rail route, depending on the availability and the choice of the consumer.

Regarding the second point, the Department of Transport have indicated that the construction of the coal jetty at the Port of New Tuticorin has since been approved and the contract for the work has also been rewarded. Close liaison is being maintained by them with the Tamil Nadu Government in so far as it relates to meeting the requirements of coal for this thermal power station being set up there, by the coastal route.

[Ministry of Energy (Deptt. of Power) O.M. No. 40/9/78-Coord, dated the 18 Nov., 1978]

Recommendation Sl. 76, (Paras Nos. 7.44 to 7.46)

The Committee note that the Tarapur Atomic Power Station reactors use enriched uranium as fuel, and under the bilateral agreement between Government of USA and Government of India, all requirements of enriched uranium for use as fuel in these reactors "shall be made available by the United States Atomic Energy Commission (USAEC) and that India shall not obtain these from other sources", and that the Tarapur Station "would be operated on no other special nuclear material than that furnished by the Government of USA". This restriction, it is presumed, would not apply to the enriched uranium fabricated in our own country.

The Committee had earlier pointed out in their 129th Report (1969-70) and subsequently in the 29th Report (1972-73) that Government should explore the possibility of building reserves of enriched uranium to meet unforseen contingencies in which the supply of enriched uranium might be cut off or denied.

The Committee find that supply of enriched uranium by US was recently held up for a year because of various objections raised in that country. In this context they also take note of the observation made by the Prime Minister in Lok Sabha on 13th July, 1977 "I hope it (supply of enriched uranium) will be regular now, but who can say what will happen in the future". The Committee view with concern the total dependence of the Tarapur reactors on the supply of enriched uranium from the USA. The recent developments in regard to the supply of enriched uranium which was admittedly delayed for a year by the US authorities and the restrictions placed on India categorically forbidding her to get requirements of enriched uranium from any source other than USA abundantly go to show to what extent the Tarapur Atomic Power Station is dependent on supplies from USA and the developments

in that country. This, the Committee feel, is not a very happy situation. Government should have a fresh look at the whole arrangement and take necessary steps to ensure uninterrupted working of the Tarapur Atomic Station.

Reply of Government

The bilateral agreement between Government of U.S.A. and the Government of India does not permit the use of nuclear fuel other than that supplied by Government of U.S.A. Accordingly, as long as the agreement with the Government of U.S.A. remains in force, it will not be permissible to use even the uranium enriched in India as a fuel for the Tarapur Atomic Power Station. The Government have endeavoured to build reserves of enriched uranium to the extent compatible with the provision of the Agreement.

The Government agree that dependence of Tarapur reactors on supply of enriched uranium from external sources is not a very happy situation, a circumstance we share with many other countries. Government's recognition that dependence on external sources is not desirable is one major reasons why all our subsequent nuclear power stations are based on natural uranium available within the country.

[Ministry of Energy (Deptt. of Power) O.M. No. 40/9/78-Coord, dated the 18 Nov., 1978]

Recommendation Sl. No. 82, (Para No. 7.84)

The Committee are informed that the country is not independent yet for things like valves and forgings required for atomic power stations. The Committee also observe that this dependence has created bottlenecks coming in the way of completion of the Atomic Power Station at Kalpakkam near Madras.

Reply of Government

Dependence for import of some special raw materials, pumps and valves for heavy water services and special instruments are unavoidable for units under construction. Import content is being progressively reduced. Some of the special heavy water pumps are planned to be manufactured in India from Narora-2 onwards. How-

ever, minimal imports of some special raw materials and proprietory/special equipment are unavoidable.

[Ministry of Energy (Deptt. of Power) O.M. No. 40/9/78-Coord, dated the 18 Nov., 1978]

Recommendation Sl. No. 91 (Para No. 8.42)

The Committee also note that the question of separation of cadres of generation and transmission engineers to improve their operational efficiency was taken up with the States. Seven States have agreed so far to the separation of cadres. The Committee would like the Government to impress upon the other States the need to separate the cadres as early as possible.

Reply of Government

The question of streamlining the management of the State Electricity Boards and the adoption by them of measures to promote professionalisation and specialisation has been discussed in various Conferences of State Power Ministers and the Chairmen of the State Electricity Boards. It is accepted that the State Electricity Boards must professionalise their management cadres capable of maintaining effective professionalisation for different functions. A State Electricity Board usually requires specialisation of skills in generation—both thermal and hydro—transmission and distribution, rural electrification, commercial and economic matters and accounting. It has been impressed upon the States/State Electricity Boards from time to time, therefore, to introduce specialisation and professionalisation in their cadres. This matter was also discussed in the last Conference of State Power Ministers as well as of the Chairmen of the State Electricity Boards held in January, 1978. It was accepted "that attention must continue to be given to strengthen the Electricity Boards organisationally through measures designed to promote prefessionalisation and specialisation". The Prime Minister had addressed this Conference of State Power Ministers and had specifically highlighted the need to ensure that the electricity supply industry, which is a major public sector industry in the country with the largest investments made in any single sector so far, was managed more efficiently and economically so as to secure optimum benefits from the investments already made and to speed up the process of economic development. He also advised the State Chief Ministers and the Ministers of Power to review carefully the existing procedures adopted in appointing the top management personnel of the Electricity Boards and the manner of determining

tariff structures so that the working and the financial viability of the Boards could be improved in the coming years. The Power Minister's Conference made a specific recommendation for the setting up of appropriate Machinery in the States for the objective selection of the Chairmen and Members of the State Electricity Boards to meet their functional requirements. Accordingly, the Chief Ministers/Power Ministers of the States were addressed in February, 1978, emphasising the importance of constituting appropriate Machinery towards this end. The question of specialized cadres and professionalization is also being pursued with the States concerned.

[Ministry of Energy (Deptt. of Power) O.M. No. 40/9/78-Coord, dated the 18 Nov., 1978]

CHAPTER IV

RECOMMENDATIONS/OBSERVATIONS IN RESPECT OF WHICH GOVERNMENT'S REPLIES HAVE NOT BEEN ACCEPTED BY THE COMMITTEE

Recommendation Sl. No. 37, (Para Nos. 2.284 to 2.286)

The Committee would like to point out that there is a clear statement made by the then Ministry of Energy in the Lok Sabha on 4 November, 1976 that the Government are interested in 'evolving a national power policy'. It appears to the Committee that there is some mixup between having a National Power Policy and a National Energy Policy. While admittedly power, being a source of energy it would be covered by National Energy Policy, the Committee have to point out that Government as such have not brought out any White paper or official document spelling out in detail even the National Energy Policy.

What is available, is a statement which has been laid on the Table of Rajya Sabha on 12 August, 1976 by Government in response to an Unstarred Question asking for details of decisions taken by Government on the report of the Fuel Policy Committee. A perusal of the detailed statement laid on the Table indicates that in the case of power the Fuel Committee had relied on whatever limited data was made available to them by the Central Power Commission, nuclear power authorities etc. They had clearly pointed out in several places the need for further investigation and survey with a view to update the data and prepare perspective plans in depth. This does not appear to have been done. Besides, the Committee consider that the National Power Policy should cover in detail the role allotted to hydel, thermal and nuclear ower, having regard to the overall economics of their generation, transmission etc. The Power requirements particularly for industrial development of backward areas and rural areas for the next 20—25 years have also to be projected in some detail in the National Power Policy.

The Committee feel that it would have been more appropriate for Government to have brought out a White Paper on Energy so that there was a Nation-wide debate on this matter which has a

direct and intimate bearing on the developmental requirements. The Committee in this connection note the statement of the Minister of Energy made in Lok Sabha on 14 July, 1977 in reply to the discussion on Demands for Grants of his Ministry that "we are preparing an action plan for adding to installed capacity with a view to achieving self-sufficiency in meeting power demands at least by the end of the Sixth Plan". The Committee would like Government to bring forward a White Paper on National Power Policy at the earliest which would cover *inter alia* the projects of power requirements for the next 20—25 years and the extent to which these requirements would be met by hydel, thermal and nuclear power, etc. The White Paper may be placed in time before Parliament so that there is well informed discussion both inside and outside the House before the National Power Policy is crystallised on the basis of a national consensus, and the schemes for power for the Sixth Plan are at least formulated in that perspective.

Reply of Government

The Committee's observations are noted.

As already mentioned, a Working Group had been constituted in September, 1977 to recommend a power programme for the period upto 1982-83 and outline a broad perspective of power development upto the end of 1987-88 keeping in view the aspect of geographical distribution of resources and their optimum utilisation. The Working Group had made a comprehensive review of the power supply situation in the country and the problems faced by the power supply industry in meeting the growing demands for power and outlined a strategy for power development. The basic objective of the power development programme was to achieve self-sufficiency and utmost reliability in power supply in all parts of the country in the shortest possible time.

The Working Group had considered the various options available for power development and the advantages and the limitations in adopting each one of them. The need for and the prospects of integrating the power systems at the regional and national level had also been considered. The complementary roles of the Central and State Govts/Electricity Boards in accelerating power development had also been considered. Based on these considerations, the Working Group recommended a detailed power programme upto 1982-83 and a broad perspective of power development for the succeeding five year period. The main focus of the programme was to ensure adequate power supply to meet the power demand as projected in the 10th Annual Power Survey.

The power programme envisaged in the Draft Five Year Plan 1978-83 is mainly based on the strategy outlined by the Working Group though the programme has been scaled down consistent with the demand projections of the Planning Commission conforming to the overall strategy of economic development set-out in the Plan.

The Working Group has been reconstituted to review the power programme for the period 1978-83 and extend it by one year. The Working Group will, in the process of its review, reconsider the strategy outlined by it and modify it to the extent necessary.

Thus, the planning for power development in the short and medium term is continuously being reviewed and policy guidelines adjusted according to needs and developments in the sector. The Central Electricity Authority is also undertaking exercises to prepara long term and perspective plans for power development. These exercises will enable outlining of a long-term strategy for power development, which will be reviewed from time to time.

In view of the dynamic nature of the planning process in the field of power development and the fact that the policies and strategies adopted from time to time are made available to all farmers, there may not be any need for a special white paper to be brought out at this stage. However, the Government will keep in view the recommendations of the Committee for consideration at a future date.

In regard to the White Paper on National Energy Policy, it may be mentioned that the Planning Commission have constituted a Working Group on Energy Policy to develop a perspective for the next 5 to 15 years and recommend appropriate policy measures for optional utilisation of available energy resources. The terms of reference of the Working Group are:

(a) to estimate the prespective energy demand in the different sectors of the economy and regions of the country by 1982-83 and a decade thereafter,

(b) to survey the present and perspective supplies of energy,

(c) to recommend measures for optimum use of available energy resources, and

(d) to outline the national policy for the next five years, fifteen years and the longer term conservation policy.

The recommendations of the Working Group, when finalised, would form the basis of review of the energy policy were necessary.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18 November, 1978]

Comments of the Committee

Please see para 1.14—Chapter I of the Report.

Recommendation Sl. No. 44, (Para Nos. 3.56 to 3.61)

The Committee in their earlier report in 1973 had expressed distress on the high incidence of 18 to 25 per cent of transmission|distribution losses in the country compared to 5.7 to 12 per cent in other countries. The Committee are of the view that imbalance in the planning of generation *vis-a-vis* transmission and distribution and investment in transmission|distribution facilities not being upto the desired level were some of the factors responsible for such high losses and recommended a continuous watch over efficiency of operation in generation, distribution and transmission system. They also drew attention to the points of action recommended by the Power Economy Committee in regard to improvements in the transmission and distribution designs to reduce such losses.

The Committee observe from the replies of the Government that the main reasons for losses were inherently low power factor of agricultural pumping loads and long lengths of sub-transmission and distribution lines in the rural areas, and that wherever there had been extensive rural electrification, the power losses were found to be high.

The Guidelines issued by Government to the State Government for reducing transmission distribution losses include (i) setting up of special units in the State Electricity Boards to prepare schemes, (ii) amendment to the conditions of supply to make it obligatory on the part of consumers to instal shunt capacitors (which would bring down the loss to 50 per cent before new connections are given), (iii) erection of new transmission lines and sub-stations to reduce over-loaded lines etc., and (iv) measures to prevent pilferage of energy and tampering of metering equipment etc.

The Committee also note that the Rural Electrification Corporation has granted loan assistance to States to the tune of Rs. 10.74 crores for 55 system improvement schemes till November, 1976.

The Committee would have been happy if all these and other measures stated to have been taken by Government had brought about substantial reduction in the transmission/distribution losses, which the country can ill afford in the context of our critical energy situation. The Committee, however, find to their dismay that since 1970-71 the losses instead of coming down have been rising every year. In 1971-72 they were 18.75 per cent, compared to 17.5 per cent in 1970-71, then rose to 19.94 per cent in 1972-73 registered further increase in 1973-74 when it stood at 20.46 per cent and further rose to 20.48 per cent in 1975-76.

The Committee have noted the claim of Govt. that the percentage increases in losses during these years have shown a downward trend in spite of large scale rural electrification and pump set energanisation programme indicating thereby that the measures taken had the definite impact in arresting substantial increase in losses. The Committee are not convinced by the claim made by Government. They feel that the losses are very high and with effective measures could be brought down considerably—The Committee would, therefore, like Govt. to take determined measures to bring down the losses to 14 per cent which is the suggested limit to which losses could be reduced at the earliest so that more power is available for agriculture and industrial purposes from the existing systems.

Reply of the Government

The transmission and distribution losses reported by the States include a substantial amount of energy unaccounted due to theft, wrong metering and incorrect billing. The States have been urged from time to time to take necessary steps for preventing the pilferage of energy as well as for improving the distribution systems with a view to reducing losses resulting from over-loading, poor power factor, etc. etc. Financial assistance to States for system improvement projects have also been provided through the REC. As a result of various measures—Administrative and Technical-taken by the States the losses (inclusive of thefts) have been reduced from 20.48 per cent in 1974-75 to 19.92 per cent (provisional) in 1976-77.

The principal reasons for increase in the losses, due to implementation of accelerated programme of rural electrification are as following:—

(i) In the transformers, two types of losses occur. The first is directly proportional to the current drawn by the consumers and is called as "Copper Losses". The second type of losses known as 'Iron Losses' is independent of the quantum of current drawn by the consumers. The rural loads being seasonal have a poor load factor and as such, the losses in transformers are relatively more as compared to the transformers feeding urban loads which have higher load factors.

(ii) Agricultural and agro-based industrial loads form the bulk of the rural demand. The motive power for these loads is provided through induction motors. Since in most cases the capacity of the induction motors is not properly chosen, they are only partially loaded for most of the time. This results in consumption of power at a very low power factor leading to increase in losses.

(iii) When large scale rural electrification programme is sought to be implemented with limited resources, it often leads to over-extension of the distribution system as a result of which the rural systems are over-loaded and thereby, result in higher system losses.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18 November, 1978]

Comments of the Committee

Please see para 1.19-Chapter I of the Report.

Recommendation No. 68 (Para 5.100 to 5.102)

The Committee note that the State Electricity Boards are empowered under section 49 of the Eelectricity (Supply) Act, 1948 to fix tariffs for supply of electricity for various categories of consumers from time to time keeping in view, *inter-alia* (a) the nature of supply and the purpose for which it is required; (b) co-ordinated development of supply and distribution of electricity within the State in the most efficient and economic manner, with particular reference to development in areas not adequately served with electrictty; (c) the simplification and standardisation of methods and rates of charges for such supplies; and (d) the extension of supplies of electricity to sparsely developed areas. It has also been stated that under section 59 of the Eelectricity (Supply) Act, 1948 the Boards are required to carry out operations and adjust the tariffs in such a manner as not to incur loss. In fixing tariffs considerations emanat-

ing out of general policy of the State Governments, such as speeding up of agricultural development and augmenting employment opportunities are generally kept inview. It has been further stated that the Eelectricity Boards have framed generally uniform tariffs for both rural and urban areas though it is usually much constlier to deliver power to rural areas. The Ministry have also stated that the tariffs for agricultural purposes and for small scale industries are generally kept below the cost of supply with a view to encouaging consumption of electricity for agricultural purposes and for running small scale industries.

The Committee also note that according to the Ministry of Energy some element of loss is inherent whenever electricity passes through transmission and distribution systems and the cost thereof is to be recovered from the consumers in the interest of the commercial viability of the Boards and that the costs of extending power supply for agricultural pump-sets and rural areas are comparatively high because of the extensive distribution systems to be erected and the low density. The Committee were further informed that "even so the tariffs for agricultural consumers are generally lower than for other categories of consumption".

The Committee, however, find from the statements (Appendix XIV to XVI) furnished by Government that except for Kerala and Delhi, large industrial consumers pay less tariff for electricity consumption than the small industrial consumers. In States like Karnataka, Maharashtra, Uttar Pradesh and West Bengal the difference in tariff is in fact as much as 10.30, 8.84, 8.2 and 9.16 paise per unit. The Committee also find contrary to the claim of the Ministry of Energy, that the tariffs for agricultural consumers are generally lower than other categories of consumption, the agricultural consumers in States like Gujarat, Haryana, Jammu and Kashmir, Karnataka, Maharashtra, Uttar Pradesh and West Bengal pay more tariff than the large industrial consumers. The Committe need hardly point out that if any real break-through is to be made in encouraging agricultural consumers to utilise electric energy for agricultural purposes, the present tariff schedules would have to be made reasonably economical for them. The Committee feel that it is high time that a review of the tariff charged by different State Electricity Boards for different categories of consumers is made, keeping in view not only the viability of the Boards but also the paying capacity of different categories of consumers. The Committee would like that such a re-appraisal is done at the earliest and new norms and guide-lines evolved in regard to the electiricity tariffs to be charged from different categories of consumers.

Reply of Government

The generation of electricity at power stations takes place at extra high voltages which are successively transformed to appropriate levels for different types of consumption. The costs involved in the transformation and transmission of power contribute towards the cost of supplying electricity to the consumers and this is the highest in the case of supply to rural areas on account both of the low voltage at which this is done and the length of transmission net-work which is required for the purpose. Thus, the supply of electricity at different voltages, in effect, makes electricity a 'different' commodity at the various voltages at which it is made available.

As regards the observation of the Committee that except for Kerala and Delhi, large industrial consumers pay less tariff for electricity consumption than the small industrial consumers, it may, as stated above, be mentioned that when electricity is to be supplied to a consumer, the power generated is to be transformed in the sub-stations to appropriate voltages and transmitted over extensive transmission lines before it can be supplied to the consumer. This not only involves loss in the process but also in costs such as interest on investments, depreciation and operation and maintenance. If power is to be supplied to a smaller consumer who takes power at lower and medium voltages, transformation will have to take place in several stages and transmission and distribution lines of different voltages will have to be laid. In the case of large industrial consumers who take power at high or extra high voltages, the investments to be made are considerably lower as there is no need to put up LT distribution lines or sub-stations. As installations consume more energy, the cost on account of transmission unit of energy consumed is further reduced. Normally tariffs are requierd to be formulated in such a manner as to reflect the cost. In almost all cases, the larger industries subsidise, at least partially, the cost involved in supplying energy at low voltages to small scale industries and agriculture.

According to the Electricity (Supply) Amendment Act, 1978 the State Electricity Boards are required, under Section 59, to earn a surplus after meeting all the expenditure chargeable to revenue and taking into account the loan amortization liabilities and accruance from depreciation. In case the Boards are required to reduce the tariffs to agriculture, it may be necessary to provide subventions to the Board under Section 63 of the Electricity (Supply) Act so as to enable them to meet the objectives outlined in Section

59. Such a step is all the more necessary in view of the poor financial condition of many of the Boards. This matter was also discussed in the last Conference of State Power Ministers held in January, 1978. It was recognised during the discussions that the State Governments|State Electricity Boards may take appropriate steps, such as timely completion of Power Projects, maximising power generation by effecting improvements in the performance of the plants and strengthening man-power planning etc., as all these factors would contribute significantly towards improving the financial performance of the Boards.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18 November, 1978]

Comments of the Committee

Please see para 1.46 Chapter I of the Report.

Recommendation Sl. No. 94, (Para Nos. 8.56 and 8.57)

The Committee had in their 39th Report (1972-73) emphasised the usefulness of 'Hot Line Maintenance Techniques' being adopted in the country on a large scale and expressed their concern at the closing down of the two centres—one at Bangalore and another at Ganguwal—which were set up by the Government after entering into an agreement with US AID. The Committee had urged that Government should set up training Centre/Centres for imparting training in this techniques as early as possible so as to meet the needs of the State Electricity Boards and other bodies engaged in the operation and maintenance of power supply in the country.

The Committee note that out of the two Hot Line Training Centres only the training centre at Bangalore has been reopened and it has started functioning from August 1975. The Committee also note that Government propose to establish a Hot Line Training Centre in the Northern Region itself as early as possible, and that this Centre would impart training in Bare hand Method which is stated to be a modern method and has the advantage of eliminating the use of live line tools and increasing the degree of safety. The Committee would urge the Government to expedite the opening of this Centre. They would further like that training in the 'Bare Hand Technique' may also be started at the Bangalore Centre at the earliest.

Reply of the Government

The Hot Line Training Centre has been set up at Bangalore to impart training to the engineers and technicians of various electri-

city boards in the techniques of live-line maintenance of overhead transmission lines. A provision of Rs. 32.84 lakhs has been made for HLTC, Bangalore, in the Annual Plan for 1978-79. In the Bare hand techniques it may be mentioned that two distinct practices seem to be in vogue *viz.* North American continental and Russian. A decision, on the practice to be adopted to suit our conditions would be taken after a study of these two in detail.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18 November, 1978]

Comments of the Committee

Please see Para 1.48-Chapter I of the Report.

CHAPTER V

RECOMMENDATIONS/OBSERVATIONS IN RESPECT OF WHICH FINAL REPLIES OF GOVERNMENT ARE STILL AWAITED.

Recommendation Sl. No. 58, (Para No. 5.21)

The Committee are surprised that Government do not have statistical data in regard to the setting up of agro-based industries and the employment generated as a result of rural electrification. All that the Committee have been infomred is that under the scheme sanctioned by the Rural Electrification Corporation, electricity has been provided to 16,509 LT|Agro-Industries and 4.30,440 domestic| commercial services upto June, 1976. The Committee feel that it is high time that a systematic and scientific assessment of the impact of electrification on rural economy is made so that it may facilitate preparation of integrated schemes for future rural development through electrification. The Committee hope that Government would address themselves urgently to this task and inform the Committee of the results of such an assessment in due course.

Reply of the Government

The matter has been taken up with the Planning Commission. The result will be intimated to the Committee in due course.

[Ministry of Energy (Department of Power) O.M. No. 40|9|78-Coord., dated 18 November, 1978]

Comments of the Committee

Please see para 1.51-Chapter I of the Report.

NEW DELHI;
April 26, 1979
Vaisakha 6, 1901 (Saka)

SATYENDRA NARAYAN SINHA
Chairman,
Estimates Committee.

APPENDIX I

(*Vide* Recommendation 16—Para 2·116)

List of Project Completed

S. No.	Title	Institutions	Investigator	Commencement / Completion date	Remarks
1	2	3	4	5	6
1.	3 Ton Solar Airconditioner	IIT, Madras	Dr. M. C. Gupta, Head Solar Energy Lab.	Jan. 75 / Aug. 76	
2.	Solar Preheater for Drying of Milk.	AMUL, Anand	Sh. T. C. Chandran, Asstt. G. N. (Prod) AMUL, R & D Assn.	March 75 / Sept. 76	
3.	Solar Kilns for (Timber Drying)	FRIC, Dehradun	Sh. S. N. Sharma, O-IC Wood Seasoning Branch.	Feb. 75 / Aug. 77	
4.	Solar Water Pump.	BITS, Pilani	Dr. K. S. Rao, Dr. R. K. Saxena, Chem. Engg. Deptt.	April 76 / Sept. 77	Project closed.
5.	One Tonne per-day Paddy Drier.	Annamalai Univ., Annamalai Nagar.	Prof. V. R. Muthu-Veerappan, Mech. Engg. Deptt.	Jan. 75 / Jan. 78	
6.	Fresuel Condensors.	IISc., Bangalore	Dr. M. Ramakrishna Rao Prof. CISL, IISc., Bangalore.	Feb. 76 / Jan. 78	

1	2	3	4	5	6
7.	Solar Grain Dryer . . .	NIDC, N. Delhi . . .	Dr. S. C. Bose, Specialist, NIDC, N. Delhi.	June 76 June 78	
8.	Domestic Solar Water Heater	BHEL, N. Delhi . . .	Dr. R. K. Suri, Project Manager, ESND, N. Delhi. BHEL	March 76 July 78	
9.	Guest House Hot Water and Space Heating.	BHEL, N. Delhi	. Dr. R. K. Suri	March 76 July 78	
10.	Qutab Hotel Hot Water Project	BHEL, N. Delhi ITDC, N. Delhi	Dr. R. K. Suri	March 76 July 78	
11.	Mini Solar Power Plant .	Auroville, Pondicherry	Dr. C. L. Gupta, AGES, Pondicherry.	Jan. 75 March 76	Project closed.
12.	10 KW Electric Power Generation Demonstration Project (Phase-I).	BHEL, N. Delhi	Dr. R. K. Suri Dr. V. Seshagiri Rao Dr. M. V. Krishnamurty	Dec. 76 July 78	Phase II under consideration.
13.	MOS Silicon Solar Cells .	IIT, Kanpur	Dr. S. Kar.	Sept. 76 Sept. 77	
14.	Low Cost Silicon Solar [illegible] (Phase-I).	CEL	Sh. U. V. Warlu	Sept. 75 July 76.	Phase-II under consideration.

APPENDIX II

(*Vide* Recommendation No. 16—Para. 2·116)

Solar Energy on Going Projects Funded by (D.S.T.)

S. No.	Name of the Project.	Organisation
1	2	3
1.	Design and development of Solar Energy and Exhaust steam powered veneer dryer for plywood factories.	IPIRI, Bangalore.
2.	Development of a Cold Storage Unit using Absorption Refrigeration and Solar Energy	IIT, Bombay, BHEL, New Delhi.
3.	Development of Solar Collectors for use in various Solar Energy Devices	BHEL, New Delhi. NPL, New Delhi.
4.	Solar Boosted Heat Pumps	IIT, Madras.
5.	Design and development of a small turbine prime mover for a low temperature Rankine Cycle using solar energy.	IIT, Bombay.
6.	Solar Collector Coatings	IISc., Bangalore.
7.	12 KW Solar Power Plant	BHEL, New Delhi.
8.	Low cost selective coatings for Photothermal conversion	IIT. Delhi. BHEL, New Delhi.
9.	Solar Energy Grain Dryers	NIDC, New Delhi.
10.	10 KW Solar Power Plant	BHEL, New Delhi.
11.	Thermo Hydraulic design of Flat Plate collectors	IIT, Kanpur.

1	2	3
12.	Design and development of Solar Energy collector unit for production of High Pressure steam and vapour for applications as an alternate source of energy, e.g. water pumping and power production for variety of purposes.	PAU, Ludhiana. BHEL.
13.	Development of a Rural Solar Water Pump	BHEL, New Delhi.
14.	(*i*) Development of a Domestic Solar Water Heater model suitable for mass production .	BHEL, New Delhi.
	(*ii*) Hot Water and space heating requirements for Residential building . . .	BHEL, New Delhi.
	(*iii*) Hot water and space heating requirements for Guest House, Hardwar .	BHEL, New Delhi.
	(*iv*) Large scale retrofit solar water heating project for Qutub Hotel	BHEL, New Delhi. ITDC, New Delhi.
15.	Installation of Solar energy heating devices in silk filatures	KSCSOT, Deptt. of Sericulture, IISc., Bangalore.
16.	Design, development and fabrication of fresnel masters	IISc., Bangalore.
17.	New types of solar photovoltaic converters and Thermal Devices	IACS, Calcutta.
18.	Development of Low Cost grid contacts for silicon solar cells	ECIC, Hyderabad.
19.	Development of High concentration silicon solar cells	CEERI, Pilani.
20.	Single crystal MOS silicon solar cells	IIT, Kanpur.
21.	Extraction and purification of solar grade silicon from rice husk	IIT, Kharagpur.
22.	Development of thin film cadmium sulphide solar cells	IIT, Delhi.
23.	Development of Photogalvanic cells	IIT, Madras.
24.	Development of Non tracking concentrator for solar cells	BITS, Pilani.

25.	Studies on Polycrystalline silicon for photovoltaic solar energy conversion . . .	NPL, New Delhi.
26.	CdS & CU_2S solar cells	IIT, Delhi.
27.	Development of Low Cost Solar Cells	CEL, New Delhi.
28.	Natural Energy Oriented Eco-house	Auroville, Pondicherry.

APPENDIX III

(*Vide* Recommendation No. 46—Para 3·63)

Steps taken by State Governments Electricity Boards to Implement System Improvement Schemes

Sl. No.	Name of the State	No. of Schemes	Total Estimated Cost	Likely date of completion	Whether REC is giving loan	Remarks
1	2	3	4	5	6	7
1.	Gujarat	10	Rs. 778·94 lakhs	7 completed 2 by 78-79 1 by 79-80	REC is giving loan except for one scheme ; total loan comes to Rs. 417·34 lakhs.	A system planning Cell has been created at Baroda for computer study of system of Gujarat in stages and to prepare system improvement scheme of financial assistance from REC and for monitoring execution of schemes. A year-wise programme for study of areas for system improvement and its implementation has been drawn up to cover all the districts by 1982-83. This consists of 13 schemes estimated to cost Rs. 46·39 crores.
2.	West Bengal	1	Rs. 29·33 lakhs	Completed	Yes	REC has sanctioned loan of Rs. 12·38 lakhs. The balance will be borne by the Board. The project covers part of Nardia and Burdwan Distts. and provides for (*i*) 700 Nos. L.T. capacitors (*ii*) changing ACSR conductors for 14·5 k.m. (*iii*) changing 8 SWG G. J.

						Wire (*ii*) erection of a new sub-station at Katwa and (*v*) erection of 33 KV overh. tr line.
3. DESU .	—	Rs. 415·00	March, 79	No		DESU is working on the schemes of providing new tubewells connections in the rural areas. Since all the villages have been electrified, works are being done to expand and modify rural distribution system and to give new connection for agriculture and other purposes. Tell now this scheme is financed by loan assistance from Govt. under MNP. The works are likely to be completed by March, 79. It is proposed to get subsidy from REC during Sixth Plan.
4. Maharashtra .	20	Rs. 1260·00 lakhs.	All the schemes will be completed by 80-81.	10	Schemes (total estimated cost Rs. 538 lakhs) have been sanctioned/expected to be sanctioned. 10 other schemes (total estimates Rs. 672·00 lakhs) have been submitted to REC for sanction.	Loan already issued for 7 schemes. The Board has sent 10 more schemes to REC for loan assistance. The Schemes are treated as district level schemes and these are allocated by the District Planning and Development Council.
5. Bihar .	22	Rs. 1425 lakhs	—		REC loan is available for 12 schemes costing Rs. 650 lakhs approx. Another 10 schemes have been submitted to REC for sanction.	In additon to the 12 schemes sanctioned and which are financed by the REC. 10 schemes have been submitted to REC for sanctioning loans.

1	2	3	4	5	6	7
6.	Nagaland .	1	Rs. 10 lakhs	Nov., 1978	No	The scheme envisages installation of metering equipment for identifying areas of losses. After completion, phase II of the scheme will be aken up.
7.	Haryana .	13	Rs. 1010.20 lakhs	March, 1980	5 schemes (amounting to Rs. 365 lakhs) sanctioned by REC. Other schemes under preparation.	..
8.	M.P. .	4	Rs. 2099 lakhs	2 by March, 79 and 2 by March, 80.	No (1 scheme has been submitted to REC for sanctioning loan)	The schemes are under execution and financial assistance from LIC and Commercial banks has been sought for. In addition to this the Board as formulated the system improvement scheme costing Rs. 30 lakhs which has been submitted to REC for sanctioning loan.
9.	Mizoram .	..	..	..	..	Due to inadequate organisational set up many measures could not be implemented. The electricity Department has surveyed the power requirements of Mizoram and has proposed 132 KV line from Assam Grid to Lungloivia Zema-Bank.
10	Punjab .	84	—	Under execution	An amount of Rs. 566·00 lakhs sanctioned by REC in respect of schemes under execu-	Since the REC has been slow in sanctioning the schemes, 6 schemes were

				tion. Few others are being submitted to REC for sanction.		approved by State Government recently. A total number of 11 schemes are under execution at present. According to the scheme circulated by REC in Aug., 77, 7 schemes for rural areas amounting to Rs. 430·12 lakhs have been got sanctioned from the REC and are under execution, 3 other schemes have been submitted to REC. 8 schemes are for urban areas.
11.	Tamil Nadu	8	—	Under execution	Yes	The suggestions made by Central Board of Irrigation and Power for improving distribution system have been accepted. Metering arrangements have been completed on almost all the feeders in sub-stations and line losses in each district is being assessed. A master plan for each area has been evolved in respect of few areas.
12.	Himachal Pradesh	—	—	—	—	The Board has decided to carry out distribution system planning studies in collaboration with M/s. BHEL. A separate Cell will be created to suggest various measures to reduce transmission and distribution losses.
13.	Orissa	6	Rs. 829·84 lakhs	82-83	No	For strengthening of lines, providing metering and for upgrading of transformers and installation of capacitors, detailed schemes are under for-

1	2	3	4	5	6	7
						mulation and will be forwarded to REC soon. Another scheme for providing grid sub-station, distribution sub-station installation capacitors, strengthening of lines optimization of line length modification and improvement of sub-station; is financed under the T & D scheme of the electricity Board.
14.	Karnataka	51	Rs. 1139 lakhs	2 schemes by 1979, 4 schemes by 1980 and the rest thereafter.	31 schemes are financed by the Elect. Board and 14 schemes by the REC. 6 schemes are to be surveyed.	14 schemes being financed by REC are estimated to cost Rs. 890 lakhs ; and 31 schemes being financed by the Board are estimated to cost Rs. 202 lakhs.
15.	Uttar Pradesh		Rs. 70.64 lakhs	March, 80	Yes	Three Tehsils of Bulandshahar district are covered by the schemes so far undertaken. Only one scheme has been sanctioned by REC. Efforts are being made to formulate four additional improvement schemes during current financial year.
16.	Rajasthan	10	Rs. 297·484 lakhs	4 schemes by March 1980—and the rest by March, 1981.	Yes (Five schemes are yet to be sent to REC for sanction).	Four schemes of Rs. 104·13 lakhs have already been cleared by the REC for loan. One more

						scheme is under consideration by REC. Five Schemes are under formulation and will be submitted to IREC soon. The scheme under consideration by REC is estimated at Rs. 53·48 lakhs and scheme under formulation are estimated at Rs. 139·80 lakhs.
17.	Andhra Pradesh .	29	Rs. 927 lakhs	7 schemes to be completed by 1979 and 22 others by 1980.	7 schemes are sanctioned by REC (estimated Rs. 427 lakhs). For 22 schemes (Rs. 500 lakhs) there is no REC loan.	The scheme envisage : (i) 56 new 33/11 kv sub-stations. (ii) 1200 KM new 33 kv lines. (iii) 905 KM. new 11 kv lines. (iv) 432 KM reinforcement of existing 11kv lines. (v) Augmentation of Pr. Tr. capacity to the extent of 1,81,550 KVA. (vi) 862 additional Distribution transformers; and (vii) 70 additional 11 kv kilosks During 1978-79 an amount of Rs. 108 lakhs is also provided for voltage improvement works. Action has been taken to implement this sch eme also.
18.	Kerala .	3	Rs. 169·97 lakhs	1980	Yes	. . .
19.	Goa, Daman & Diu	16	Rs. 30·27 lakhs	A majority of the schemes will be completed by March, 79. A few thereafter.	No	.

APPENDIX IV

(*Vide* Introduction to the Report)

Analysis of Action Taken by Government on the 16th Report of Estimates Committee (Sixth Lok Sabha)

I.	Total No. of recommendations	99
II.	Recommendations/Observations that have been accepted by Government:	
	Nos. 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 22, 23, 24, 25, 27, 28, 30, 31, 32, 33, 34, 36, 38, 39, 40, 41, 42, 43, 45, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 57, 59, 60, 61, 62, 63, 64, 65, 66, 69, 70, 71, 72, 74, 75, 77, 78, 79, 80, 81, 83, 84, 85, 86, 87, 88, 89, 90, 92, 93, 95, 96, 97, 98 and 99.	
	Number :—	82
	Percentage to total :—	82·8
III.	Recommendations/Observations which the Committee do not desire to pursue in view of Government's replies (Nos. 6, 17, 21, 26, 29, 35, 50, 67, 73, 76, 82 and 91).	
	Number :—	12
	Percentage to total :—	12·2
IV.	Recommendations/Observations in respect of which replies of Government have not been accepted (Nos. 37, 44, 68 and 94).	
	Number :—	4
	Percentage to total :—	4
V.	Recommendations/Observations in respect of which final replies of Government are still awaited (No. 58).	
	Number :—	1
	Percentage to total :—	1

GMGPMD—762 LS—L.S. II—22-9-79—1054.